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THE SKETCH-MAP AS AN AID IN THE TEACHING OF HISTORICAL GEOGRAPHY[1]*

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The purpose of this paper is to discuss the place of the sketch-map in the teaching of historical geography. The discussion will deal with the following matters: (1) the problem which the teaching of historical geography presents in general; (2) the relative success or lack of success with which this problem is being solved; (3) the relative value of the sketch-map method as compared with other methods in use; (4) difficulties which stand in the way of the wider use of the sketch-map method; (5) means of overcoming these difficulties; (6) a sketch-map of Europe by way of illustration.

In trying to make historical geography mean something to students, doubtless the heart of the problem is to get them to think in terms of physical features. There is no one, I think, who would seriously question this statement. Historical geography is concerned with the changing areas of states, and is most in evidence during an early period of political consolidation and a later period of territorial expansion. The particular task of historical geography is to know the names of the areas involved in both these

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processes and to know what geographical area is designated by a given historical name. In the case of our own country, for example, the names of Virginia and Massachusetts are connected intimately with the period of political consolidation of our country; those of the Louisiana Purchase and California, with the period of our westward expansion. It is the task of historical geography to make clear the geographical scope of such names.

But how is one to make clear either to one's self or to others the geographical scope of names of this sort without knowing some of the physical characteristics involved, without having something definite with which to associate the names? Obviously, must one not have something to which to tie? A very simple means of testing this matter is at hand, and is offered by the character of our own mental pictures of location. What, for example, is the mental picture called up by the name "New York City," or by that of "Chicago"? In the case of New York, some consciousness that it is on the coast at the mouth of the Hudson immediately comes to us, and, in the case of Chicago, we see Lake Michigan with the city planted at its edge near the southwest corner. Or, suppose the states in which the cities are placed be taken, does not the mental picture involve the Hudson again and the Great Lakes in the one case, and, in the other, Lake Michigan and the Mississippi? Conversely, is it not the lack of knowledge of the physical characteristics which makes the mental pictures of other places and political divisions vague? What, for example, is the character of the mental picture when we speak of Burgundy, Bedfordshire, or Württemberg? Are they tied definitely to anything? Do they not float loosely around "somewhere in France" and the other countries? Can we not say that the vividness and the accuracy of our mental pictures vary according to our knowledge of the physical features of the area? It is perfectly clear, it seems to me, that our minds instinctively reach out for definite and specific features with which to associate the location of areas, boundaries, and places.

If, then, this is the stuff out of which mental pictures of location are made, must not our aim in teaching historical geography be (1) to train the pupil to study the physical features of the areas with which the historical narrative deals, and (2) to train him to

associate the historical areas about which he is studying with these physical features? In other words, must not our aim be to train him, when dealing with political divisions and places, *to think in terms of physical features?* But this is no easy matter, and *how* to get the pupil to do this is a problem—the very problem that the teaching of historical geography presents to us.

Now, how is this problem being attacked? Upon what methods do teachers commonly rely? With what success are these efforts attended? With these questions of method and efficiency our discussion must next concern itself.

There are three methods now commonly in use in the teaching of historical geography which claim our attention. In one of these the teachers supply themselves with wall-maps and historical charts, good, bad, and indifferent; they rely on these and on the maps in the textbooks to help convey to the pupil some notion of the physical areas that correspond to such names as Nevada, Ontario, Wessex, Lombardy, and other similar names of historical divisions. In this case the pupil is supposed to acquire the information by turning from the text, after he has read there about some territorial change to the map in the book—in case there is a map of this territory—and get a notion of the area signified by the name or names about which he has been reading. The knowledge which may or may not have been gained in this way is then further reinforced, when the matter is being touched on in class, by the act of the teacher in directing the attention of the pupils to the wall-map or chart. This is done either by a glance of the eye or by pointing with the finger or pointer. Some enthusiasts, indeed, even venture so far as to trace out the boundary line of the area in question. This method does not involve any test of the pupil's knowledge. It takes for granted that he does examine the map after reading the text; it is thus characterized, we may say, by a large measure of pious hope.

Other teachers, making less heavy drafts upon the treasury of pious hope, use all the measures to which reference has just been made and, in addition, make some effort to see that the pupil really does look at the map for himself. The means they resort to is that of the *outline-map*. In this outline-map method, the

second of the methods to be described, the pupil is required to fill in on an outline-map the area in question. He is asked to figure out from maps at his disposal, either those in his textbook or those in some historical atlas, just where East Anglia, Champagne, or Switzerland is supposed to be, and then to trace or fill in a corresponding area on his map. Furthermore, I believe, he is generally supposed to label some of the rivers and mountains that may be found on his outline-map with what seem to be appropriate names. These maps are then handed in, and the teacher is thus assured that at least the pupil has spent some effort on the matter. With many teachers the effort stops here, and the pupil is not required to be able at a written test or examination to reproduce this material from memory. By some teachers, however, this further test is applied.

A third method goes yet farther in the effort to make sure that the pupil really does acquire some of the knowledge that he is supposed to have gained. In this method, the sketch-map method, the pupil is himself required to make his own map, drawing in the coast line, rivers, and mountains; on this he must put in the boundary lines or fill in with color the area in question. Here, too, the users of this method may be divided into two classes, according as they do or do not require the pupil to be ready to reproduce his work from memory.

Under such headings, namely, the method of "pious hope," of the outline-map, and of the sketch-map, may be roughly gathered the commoner methods now in use for the teaching of historical geography.

The question that next presents itself relates to their efficiency. How well do they accomplish their aim? To what extent do they lead the pupils to think in terms of physical features?

When we ask ourselves how far the methods sketched above train the pupils to associate the given areas with physical features, how far these methods lead to the acquisition of any permanent knowledge, we shall have to admit, I think, that, on the whole, the results are unsatisfactory. The pupil, particularly in the case of European history, has his real knowledge increased very little. When Burgundy and Brandenburg can be transposed at the pupil's

pleasure, when it is insisted that the straits of Gibraltar separate Dover and Calais, when Canterbury is placed where Cairo should be, and Jerusalem is located on the Italian peninsula, it would seem evident that there is still much to be desired in the efficiency of our methods of teaching historical geography. No doubt there are teachers here and there, both in the high schools and in private schools, who are getting good results, but the evidence leads me to think that they form an almost invisible minority. Nor would their number be much increased if one included in the survey the great throng of college and university instructors who deal with undergraduates. In this matter the charge of unsatisfactory results can be brought against the history teacher both in the university and in the high school. Why should this be so? Why should the results of efforts in this subject be so uniformly far from satisfactory? It will not be without benefit to consider this matter for a moment.

The reasons for the unsatisfactory character of the results obtained in the teaching of historical geography seem to me to be attributable chiefly to the deficiencies of the maps ordinarily in use, on the one hand, and, on the other, to defective methods and to inefficient use of methods good enough in themselves.

The most striking deficiency in the maps ordinarily supplied to students is their small *size*. Both in textbook and in historical atlas the scale of the average map is so small that it is difficult, even with the best effort, to get clear ideas of the matter being studied. A less obvious but, if anything, more important deficiency is to be noted in the principle upon which historical maps are, for the most part, constructed. If the association between boundary line and physical feature is to be the guiding principle in the teaching of historical geography, it would seem necessarily to follow that historical maps and atlases should be so constructed as to bring out as clearly as possible the relationship existing between boundary and physical feature. But to this notion the majority of historical maps at present in use do great violence. The constructors of these maps seem to have felt that boundary line rather than physical feature is the important matter; in consequence they consistently emphasize boundary lines at the cost of physical features. The

heavy dotted line, black or colored, usurps the place of the Alps or the Vosges, and the Seine or the Rhine is reduced to utter insignificance or eliminated completely. Above all are they given to an overuse of color. As the combined result of these practices the features which give meaning to an area are entirely or in large part either obliterated, slighted, or utterly neglected. In such maps, as far as the pupil can see, there is no particular reason why the blue which denotes Normandy should stop and the pink which denotes Maine should begin or why the brown for Bavaria should give place to the red that denotes Austria. As a result, when he has made a picture-puzzle of France, or Germany, or England, or it may be Africa as now divided, for most of his boundary lines he has nothing but another boundary line to guide him. Thus, while he may have increased his knowledge of relations somewhat, his effort in great part has been wasted, for he has gained no lasting knowledge of physical features, without which knowledge he is in no position to grasp the mutual relations of the political divisions and boundary lines he is striving to learn. While these deficiencies in the maps from which pupils must get the desired information undoubtedly constitute a hindrance to the history teacher in his effort to teach the geographical aspects of his subject, the entire blame for poor results cannot be placed on the character of the maps at his disposal. In some cases the character of the method is at fault.

In the first method described, for example, not only is there no satisfactory test of the student's knowledge—a grave defect in any method—but it is deficient in another regard. This is due to the assumption, made by the teacher when pointing to a wall-map, that the pupils can see the map as well as himself. That this is an assumption utterly unjustified by the facts can be easily ascertained by anyone who chooses to place himself in any of the seats back of the first two or three rows where the pupils sit. In such a position one very soon discovers that the average wall-map or even chart is of very slight value as far as the pupil is concerned. The reason is that for the majority of pupils in a room the instructive features on a wall-map become blurred. The teacher, close to the map, knowing exactly the thing upon which he wishes attention to be focused, and seeing clearly enough himself the various details,

is prone to forget that the pupil is not in the same situation as himself. Furthermore, wall-maps suffer from the same defect as the maps in textbooks and atlases, though not to the same degree, in that they tend to an overuse of color to show the extent of political areas and emphasize boundary lines to the slighting of physical features. Undoubtedly wall-maps have their uses, but, unaided, they cannot be relied on to give the pupil the knowledge he ought to have. For efficient work the pupil must himself have in his hand a good map which he can study closely and at leisure.

With the outline-map method the case is different. This, if rightly employed, should produce some solid results. It remedies some of the worst defects that inhere in the first method. It takes pains to make sure that the pupil gets some of the knowledge that he is supposed to get, and makes him construct a great many of the details for himself. It is, however, robbed of its full efficiency in many cases by failure to require the pupil to label or fill in the significant physical features, and by failure to insist that the pupil shall be able to reproduce his work from memory. Naturally, too, the pupil follows the vicious model of the atlas and textbook, and splashes on color liberally, feeling, doubtless, that there is some vital connection between pink and Provence.

In the case, likewise, of the sketch-map method, the failure to secure good results is due, not to any defect in the method itself, but rather to ineffective applications of the method. That the method has been for the most part ineffectively applied is due, I think, to the lack of any well-defined system for its use.

These, then, are the methods commonly in use in the teaching of historical geography. We have seen that they are producing far from satisfactory results, and we have discussed some of the reasons for this state of things. Now, it seems to be a great pity that, of the various methods at present in use, the one which in its nature is best calculated to produce the most satisfactory results should be the least widely in use. I therefore wish to spend the rest of the time allotted me in discussing the value of the sketch-map method, examining the difficulties in the way of its wider use, and suggesting ways of meeting these difficulties, to the end that the

sketch-map method may be more widely used in our effort to teach historical geography.

In the first place, then, is the sketch-map method really superior to that of the outline-map method? Does the sketch-map method more than the outline-map method lead the pupil to think in terms of physical features—to study, that is, the relations of physical features to each other and of political boundaries to them? The particular value of the sketch-map method lies for one thing, it seems to me, in the *closer observation* which the student is compelled to give to the matter, and, for another, in the *aid it gives in visualizing* the relations of physical features to each other and of the boundaries' relation to them. For example, suppose the district in question to be *Bohemia*. What is the process through which the pupil goes? He takes a historical atlas and turns to the map which shows the location of Bohemia. He finds this location indicated by dotted lines forming a diamond-shaped figure (Fig. 1). If his map shows the physical features plainly, or if he provides himself with one that does, he will see that his diamond-shaped figure is nothing in the world but the diamond-shaped plateau drained by the headwaters of the Elbe River system and bound in by four well-marked mountain ranges. In fact, if his maps are good, he soon sees that the boundary line follows very closely the ridges of these ranges, and that, for most practical purposes, it is to be associated with these mountains (Fig. 2). Moreover, when this association is once fairly grasped, there results a mental picture of the relationship. Now, nothing will so well help the pupil to fasten these relationships in mind as the attempt to reproduce this mental picture, at first with the maps before him, and then without them. With each attempt

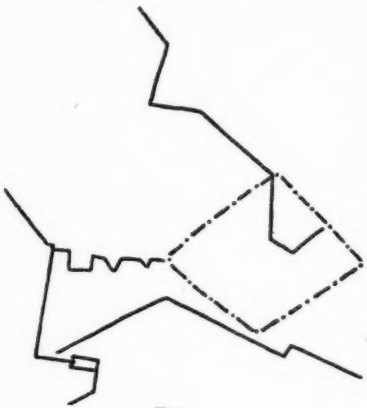

FIG. 1

there will be an increase in the accuracy and vividness of the mental picture and a corresponding improvement in the grasp of the relationships. The most conclusive proof that a pupil has a grasp of these facts and knows what he is talking about is to be found, it must be admitted, in his ability to make from memory a sketch-map of the area in question. Such an ability represents a knowledge of a higher order and more permanent character than the ability to fill in from memory the details of name and boundary line on a map already made for him. The difference in grasp is something like that between the ability required to read a language and that required to speak it. From this point of view, as between the relative worth of the outline-map and the sketch-map, there can be no question: the superiority of the sketch-map method is incontestable. It is the one device yet in use which really forces the pupil to study the matter and get a working grasp of it. It is the instinctive recognition of this fact that has always led a certain number of teachers to experiment with this method. If they have not succeeded better or been able to obtain wider recognition for the method, this fact must be set down, not to the fault of the method itself, but to the difficulties in the way of its successful application. What are these difficulties, and can they be overcome with a not too great expenditure of time and effort?

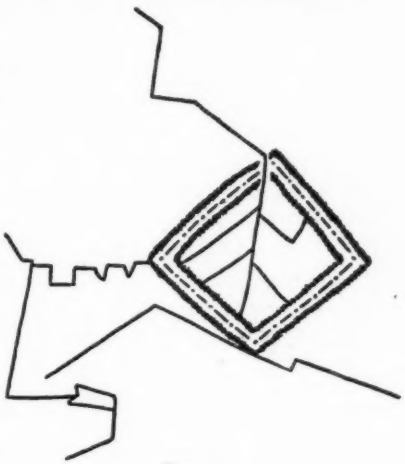

FIG. 2

Of the various hindrances that hitherto have stood in the way of a wider use of this method none is to be compared in importance to the *lack of training* in *drawing* on the part both of the teacher and of the pupil. The teacher himself does not know how to draw a map, much less can he tell the pupil how to do so. Teachers and

pupils shrink from an attempt at freehand drawing. Not being used to this sort of thing, being utterly untrained, they are completely at sea, and feel that they are attempting an impossibility. It is not perhaps especially difficult to copy the coast line of Europe; but it is felt to be quite a different matter to throw aside one's sketch, shut the book, and then remake the map from memory. This requires keen analysis of the separate parts of the map, close observation, and a great deal of drill to secure a satisfactory degree of mastery of such a map as that of Europe or similar ones. When one is untrained, the attainment of such mastery seems almost hopeless and certainly not worth the effort. In this lack of training is to be found beyond doubt, I think, the chief hindrance to a wider use of the sketch-map. By what means is this difficulty to be overcome?

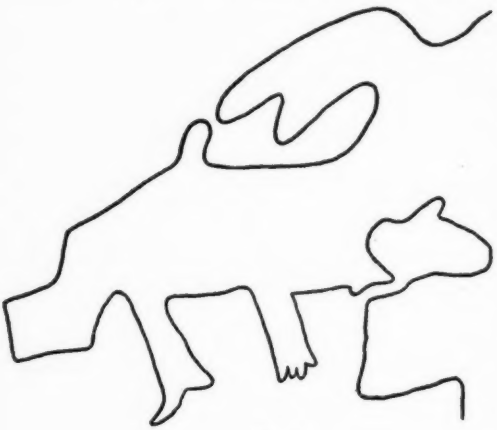

FIG. 3

Doubtless the obvious means of overcoming the lack of training in drawing sketch-maps is to supply the lack. But what is the nature of the training that will enable one to draw the necessary maps with a fair degree of ease and accuracy? How great is the effort necessary to acquire this training, and is the effort worth the while? Our attention, consequently, must next be directed to a consideration of the way in which a sketch-map should be constructed, to a discussion of the principles by which one should be guided—in short, to the *art of the sketch-map*.

If one, without any previous training, should essay to draw from memory an outline of the continent of Europe, the result would probably look something like the accompanying sketch (Fig. 3). Now, while all such first attempts are laughable because,

though suggesting the original, they are yet so grotesquely different, nevertheless they represent one's actual working knowledge of the subject and can be made to afford many useful hints and suggestions as to how one's work may be bettered. In particular, an examination of the sketch (Fig. 3) will show that unconsciously the maker has been guided by certain *principles* that are sound and that will enable him, when once they are consciously grasped, greatly to improve his work.

What, then, are the principles by which an untrained person is, when making a sketch, unconsciously guided? They are three, namely, *analogy*, *proportion*, and *relationship*. Let us first consider the matter of analogy. By this is meant the tendency to see resemblances between the things one is trying to draw and the objects with which one is familiar. One seems to feel that, if, somehow, one can catch a resemblance in this way, the task is rendered easier. This feeling is undoubtedly correct, for the mental pictures of such familiar objects, for example, as a dog, a hammer, or a square, are so clear and well defined that the moment the shape of the new object can be associated with one of these familiar objects, its outlines are no longer strange and difficult to grasp, but, on the contrary, familiar and easy to hold in mind. The vivid picture of the familiar object acts as a guide in our efforts to draw the thing before us. Ample illustration of these points can be drawn from the sketch given herewith (Fig. 3). In this case the well-marked features, the peninsulas in particular, seem to have suggested analogies, and thus stamped themselves on the mind. Scandinavia, for example, has caught the fancy with its jaws and necklike projection from the main body of the continent. Peglike Denmark, and Spain, with its resemblance to a square, give our minds a hold on them, while Italy's resemblance to a boot makes that peninsula the easiest of all to remember and draw. Doubtless, also, Europe's rough resemblance to a triangle has not been without its effect. It is in ways like these that the mind seizes upon analogies and makes use of them.

But while the mind thus makes use of analogies, it is at the same time guided by a sense of *proportion*. By a sense of proportion is meant the feeling that leads us to draw things of the same relative

size. For example, in the sketch-map of Europe given on p. 506 (Fig. 3), this feeling has led to the drawing of Spain with some reference to the size which had already been given Denmark, or the part of Europe that had been previously drawn. Had Spain been drawn three or four times larger (Fig. 4) than it now appears, anybody would have said at once that Spain was very much too large in proportion to the rest of Europe. One tends, thus, to control the size of objects by that of those already constructed; or, to put it another way, one tends to draw portions of an object *in terms* of the parts that have already been drawn.

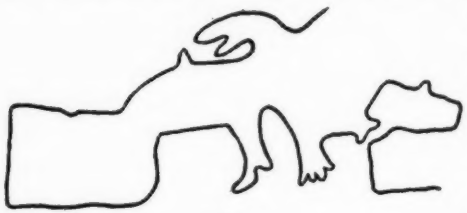

FIG. 4

Again, one is guided not only by a sense of analogy and proportion, but also by the perception of *relationship*. By this term is meant the perception that one part of the object one is drawing bears a certain relationship in position to some other part of the object. Such a relationship, when once noticed, helps one to get the different parts of an object rightly placed in relationship to each other. For example, a very simple relationship is that between Italy and Denmark. First attempts may very easily overlook the fact of this relationship and place the two peninsulas in some such relative positions as those shown in the previous sketches where Italy is placed considerably to the right or left of Denmark, instead of being, as it should be, directly under it (Fig. 5). The Danish peninsula itself, too, can in relation to the Scandinavian peninsula be more exactly placed: rather than being situated merely near the end of the peninsula it is seen to

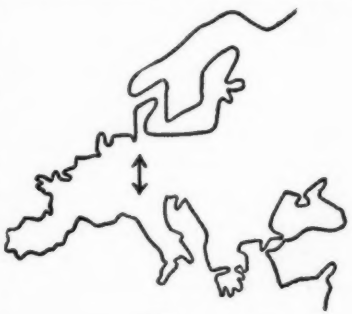

FIG. 5

reach up *into* the great jaws of this projection. Such relationships, once noticed, have a way of sticking in the mind. Furthermore, the value of this habit once having been brought home, one is constantly on the lookout to add to the number of relationships already observed. The stock of knowledge thus obtained becomes one of the main resources in enabling one to gain control in drawing the map. This fact makes itself increasingly apparent when the attempt is made to draw the internal features of the map, more particularly the rivers and mountain ridges. But before experimenting with these there are two other matters connected with the principles of analogy and proportion that should be considered. These matters are (1) the *analysis into line*, and (2) the *use of a unit of measure*.

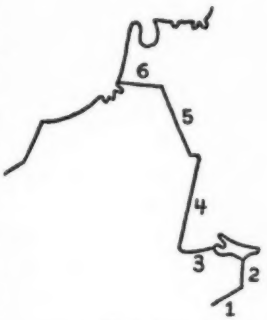

FIG. 6

Among the analogies mentioned in one of the preceding paragraphs was that of the geometrical figure. An example of its use was pointed out in the case of Spain, whose shape suggests that of the square. But a square is made up of straight lines, and, as a matter of fact, it is this analogy of the line, straight or curved, that one's mind tends to use perhaps even more than the geometrical figure, which is, indeed, only a combination of such lines. This analysis into line is especially useful because it enables one to attain much greater exactness, particularly in the matter of proportion, since, when one thinks in terms of straight lines, it becomes possible to use a unit of measure. The advantages of this use of the straight line can well be shown in drawing a river like the Rhine. If one should attempt to get all the little quirks and curves of this river, the task would seem well-nigh hopeless. But if one attempts merely to observe the principal *sections* into which the river may be broken up, and, regarding these sections as straight lines, notes their direction, relative length, and position, the task becomes quite possible and surprisingly simple. As may be seen from the accompanying diagram (Fig. 6), the course of the Rhine, from source to

mouth, is comprised in six fairly well-marked sections. Of these, the first two are about of a length; the third, if Lake Constance be left out of account, is somewhat longer than either of these two; the fourth and fifth are something more than twice as long as the third, while the last section is about half the length of either section 4 or 5. Finally, if one notes that section 2 forms a very obtuse angle with section 1, that the base line of Lake Constance makes a similar angle with section 2 and that 3 makes a scarcely perceptible angle with the base line of Lake Constance, that 4 but just fails of making a right angle with 3, that 5 inclines away from the vertical in the opposite direction and at a somewhat greater angle than does 4, and, finally, that 6 forms a blunt angle with 5, it will be found that a little practice and a little testing of one's observation by memory will enable one to reproduce at will a draft of the Rhine that will answer for most purposes. Furthermore, when working at the matter in this way, one unconsciously uses one of the lines as a unit of measure by reference to which the relative lengths of the other lines are gauged. Thus, in the present case, if section 4 be used as the unit of measure, the other sections are either the same length, half as long, or, as in the case of section 3, between a quarter and a third as long, or about a third, as in case of section 2, or about a quarter, as in the case of section 1. It can be readily seen how, by the use of a suitable unit of measure, the proportions of one's map can be very much improved and the whole made much more effective and serviceable.

Such are the principles, or at least some of the principles, of which one, in drawing a sketch-map, makes, to a greater or less degree, instinctive use. And if, in place of instinctive use, one substitutes conscious and systematic use of *analogy*, *proportion*, *relationship*, *analysis into line*, and *a unit of measure*, the task of analyzing the map, seeing what to draw, knowing what to fix attention on, will be greatly simplified and the result much improved. And now it may be well to turn from theory to practice and apply these principles in making a sketch-map of the coast line of Europe and two or three of its principal rivers.

In this systematic attempt to draw the outline of the continent of Europe, its rough resemblance to a triangle, which one uncon-

sciously appreciates and of which one makes instinctive use, can be made of the greatest service. For, if a triangle be formed (Fig. 7) by connecting three points at the extremities of Europe, this triangle may be used as a framework to guide in drawing the coast line, and will enable one to secure more easily a uniform proportion. Thus, if the three points chosen be the "chin" of Spain, the base of the Caspian Sea at its middle point, and a point near the northern end of the boundary line between European and Asiatic Russia, the lines connecting them will form a triangle inclosing nearly the entire continent. The coast line of the main body of the continent will be found to run for the most part close to these lines, only the peninsulas, the easiest portions of the coast line to draw, projecting much beyond them. But when one comes to construct this triangle preparatory to using it as a guide in drawing the European coast line, the question immediately raises itself as to the *relative length of the three sides*. This is an important question, for on its correct answer depends any effective use of the triangle as an aid in the drawing of the map. Fortunately, in this case, the relations of the three sides are very simple ones and easily held in mind. Without the aid of a ruler the eye would at once tell us that two of these lines are of about the same length; and if a ruler be used to get the exact measurements, these will be found to confirm the observation of the eye, for they show that the two sides are exactly equal. The relation of the third side to the other two is shown by the ruler also to be a simple one, for its length proves to be just two-thirds that of either of the others. In other words, we have to deal with an *isosceles triangle whose base is two-thirds the length of its sides*. Such a triangle can

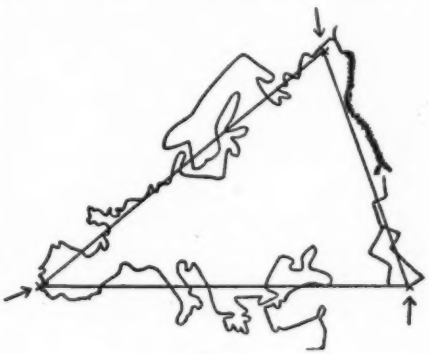

FIG. 7

be constructed with a fair degree of accuracy with no aid from a ruler, either by merely estimating with the eye the relative proportions of the three sides or by some such device as here shown (Fig. 8). In this case, if the line *AB* be drawn and divided into three equal parts, the section *BD*, which is equal to two-thirds of *AB*, may then be used in imagination as a radius, swung from *B* as a center, to guide in making the dotted curve *DC*. In the same way the line *AB* itself, swung from *A* as a center, may be used as a radius to describe the dotted curve *BC*. The intersection of these two curves at *C* gives the third extremity of the triangle. When this point has been connected by straight lines with *A* and *B*, there results the required isosceles triangle *ABC*, whose base *BC* is equal to two-thirds of the length of either of the sides.

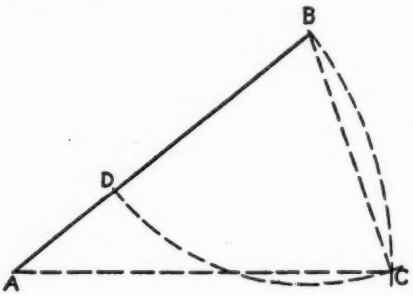

FIG. 8

Doubtless no triangle made in this way, with only these rough measuring devices to guide the eye, will prove to be absolutely exact in its proportions. Yet the results of such a method or similar ones prove to be accurate enough for all practical purposes, and the map of Europe, whose coast line has been drawn in relation to the sides of such a triangle, will be far more accurate and satisfactory than one drawn with no such guide in mind.

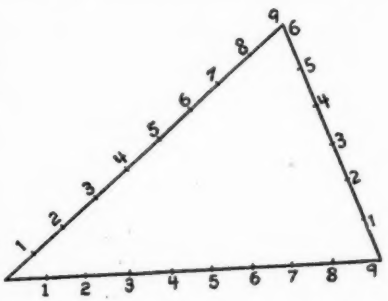

FIG. 9

But the triangle can be made to yield still further aid. If the sides be divided into thirds (Fig. 9), and these thirds themselves

be likewise divided into thirds, a division of the side into nine units results; and if the base be divided into two equal parts, and these again into thirds, a division into six units of the same length as those into which the sides have been divided results, as in the figure *ABC*. By noting the relation in position between the various features of the coast line and the division points of the units

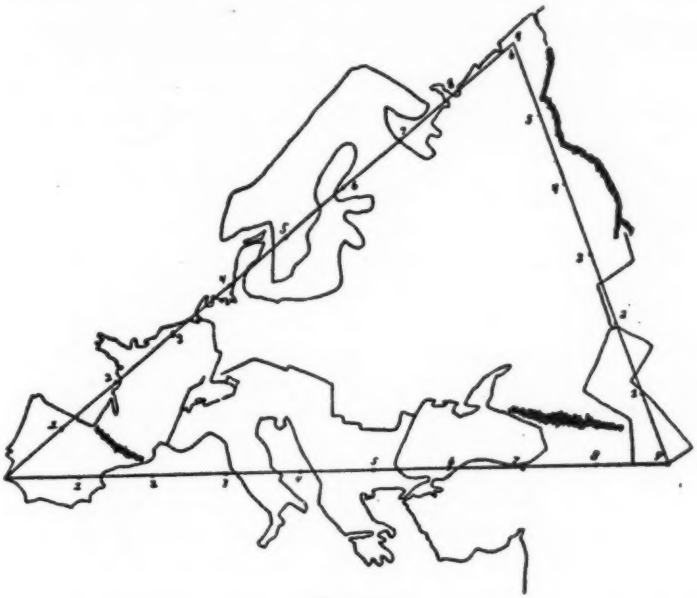

FIG. 10

the relative position and proportion of the different parts of the coast line can be attained with greater exactness. For, as may be seen in the accompanying drawing (Fig. 10), not only are the positions of Spain and the Caspian securely fixed, but also that of the White Sea, whose base passes through point 7, of the Scandinavian Peninsula, whose lower jaw incloses 5, of the Danish Peninsula, three-quarters above the line, whose western coast line just escapes 4, of the Italian Peninsula, half above and half below the line, which occupies the middle portion of the unit between

3 and 4. And what is true of these larger features is equally true of the many other smaller and less prominent ones: reference to the sides of the triangle and the units is of the greatest assistance in placing them. Furthermore, the unit which has been formed by dividing the triangle's side into ninths can be very conveniently used as a unit of measurement in drawing the various parts of the map. Thus the section of the Rhine labeled 4 in an earlier diagram (Fig. 6) is a half of this unit, as are also the first four sections of the Danube, as shown on the accompanying map (Fig. 10), and the section of the Rhone from the point at which it is joined by the Saone to its mouth, while the northern, western, and southern sides of Spain are approximately a whole unit in length. Perhaps enough has now been said to suggest the usefulness in actual practice of the principles of analogy, relationship, analysis into line, etc.

Such is the nature of the training required to enable one to draw with comparative ease a sketch-map that answers every practical purpose. As to the application requisite to acquire this training, I can speak from a large personal experience both with myself and with students. I am far from blinking the fact that there is a considerable amount of effort involved. Nevertheless, I am thoroughly convinced that its acquisition is within the reach of every teacher who is willing to give up a very moderate amount of time (say two weeks in vacation, three hours each morning) to a study and practice of the matter. I am also convinced that, if the teacher controls the method, it is entirely practicable to teach pupils to master and use the process constantly. Indeed, I might add, as a final word, my conviction that the use of the sketch-map method in some form is not only possible and practicable, but that its obvious merits will win for it a constantly increasing use in the hands of the history teachers of this country.

DIRECTED TEACHING AND DIRECTED OBSERVATION —A CORRECTION AND AN EXPLANATION

J. D. DEIHL
Wisconsin High School of the University of Wisconsin

In a recent article on the "Reorganization of Teacher Training in German in Our Colleges and Universities"[1] Mr. John C. Weigel, of the University of Chicago, makes reference to and attempts to explain the system of teacher training in operation at the University of Wisconsin. Because his statements seem to give an entirely wrong impression, and because his understanding of our work here appears either to be based upon a misconception or to go back to a condition which no longer exists, I may be permitted to state briefly what we are undertaking to do in training teachers of German. I shall refer particularly to our plan for securing practical classroom activity on the part of candidates, and shall in no sense seek at this time to give a systematic exposition of our entire teacher-training organization.

Mr. Weigel calls the Wisconsin plan "directed observation," and proceeds in his explanatory paragraph to outline rather vaguely what we very carefully designate "directed *teaching*," in order not to confuse it with our directed and supervised *observation* work, which is supplementary to and in no way a substitute for directed teaching.

Near the close of this same paragraph Mr. Weigel says:

> It is because of this fact [viz., that the instructor under whom the work is done may not be competent to direct the student successfully] that a course such as "The Teaching of German in Secondary Schools" is absolutely essential. Such a course does inform the prospective teacher in some specific way why certain types of stimuli are advisable and others not. Without such a course teaching becomes very largely imitative, which isn't bad; only it isn't enough. Any scheme of teacher training that does not include such a supplementary course as this obviously fails to produce maximum results.

[1] *Monatshefte für deutsche Sprache und Pädagogik*, XVII, 16–20, 34–44.

The implication would clearly seem to be that no such course is offered at Wisconsin in addition to the practical work: a thing which Mr. Weigel, of course, would never have implied intentionally. It is unfortunate that such a misleading statement should have been made in this connection. As a matter of fact, the teacher who has actual charge of the classroom work in directed teaching and observation both gives the course in methods (one semester, two hours) and teaches demonstration classes in the Wisconsin High School of the University of Wisconsin. Thus it will be seen that the work is made as unified as possible and is not at all one-sided.

As to directed teaching, a statement of its general aims and principles which is fairly accurate is to be found in an editorial in the *School Review*, XXIII, 199–200, although here, also, the misnomer "observation" is applied. It has been our custom to avoid detailed and formal statements as to what directed teaching is, because of the fact that it is new and is constantly undergoing improvement; hence it would be extremely unfortunate if we should incur the danger of checking this growth by defining our practice so narrowly as to give ourselves a thesis to defend. While leaving the fuller statement that eventually will be made for abler hands, I may venture to give a general outline of the process in our modern language work, and this conforms fairly well to what is done by other departments.

"Education A" or "Educational Practice" is a separate course in the Department of Education, and is usually taken either in the same semester as the departmental teachers' course or in the semester following. Ordinarily the student is in the Senior year. The course begins, as at present arranged, with a series of introductory lectures given by the principal of the Wisconsin High School to the candidates of all departments. These candidates are then assigned to various classes of the school for a period of eight weeks each, which term may be increased to sixteen under certain specified conditions. At this point the demonstration teacher and the principal of the school assume joint charge of the work. The candidates are furnished class lists and are required in the shortest possible time to familiarize themselves thoroughly with names and

seating order. At the same time they devote their attention intensively to the subject-matter in hand, and are required to prepare each assignment made in as thorough a manner as possible.

This preliminary work over, the student begins to take an active part in the conduct of the class. Without going farther into detail, the progress is from isolated questions of a simple nature, through short, easy drill exercises which the class can do with the minimum of direction, to more difficult drill material, and finally to the presentation of new material. Unrelenting insistence is put upon the development of a sensible, analytical teacher-attitude. The creation or improvement of a teaching personality capable of intelligent growth is made the chief aim, above all aims as to method or subject-matter in the narrower sense.

> The viewpoint is that neither scholarship tested in a set of academic relations nor methodology detached from practical circumstances, is adequate to the needs of the future professional worker in secondary education. . . . . Test him in the environment of actual teaching, and thereby discover ability to take the *next* step in a progressing series of unique circumstances wherein the process (teaching) remains inventive all the way. . . . . No formal teaching technique is emphasized. The rigid and somewhat protracted discipline under the master teacher is designed to render the progress of the future high school teacher toward successful accomplishment more rapid, more economical, and more confident than it otherwise would be.[1]

In the drill exercises the student is scarcely ever warned beforehand, as the understanding is clear that there must be constant and thorough preparation. For the presentation of new material, and for the conducting of an entire class period, usually previous warning is given and the candidate is assisted in working out a lesson plan. The demonstration teacher is at liberty to use his judgment as to whether an unsuccessful effort on the part of the candidate is to be interrupted and guided into a successful course, or broken off entirely. The interests of the class are never allowed to suffer in the least, as that would imperil our whole system. A failure on the part of the candidate one day may pave the way to success the next, and in the beginning more importance is attached to frequent short exercises than to less frequent long

[1] From a syllabus by Professor H. L. Miller, principal of the Wisconsin High School.

attempts. The progress from simple to complex exercises is made as gradual as possible.

It is out of the question for me here to go into the infinite possibilities of tactful suggestion, guidance, and correction, both as to subject-matter and method, as well as personal attitude. Suffice it to say that there is no sentimental sparing of a candidate's feelings, although every effort is made to keep the criticisms just and constructive. The daily written analyses of the recitation period are made the basis of frequent conferences of five or ten minutes, and the instructor or supervisor writes brief comments on the margins of the daily report cards, or on separate sheets, all of which are then filed in a cabinet provided for the purpose, and gone over regularly by the students. It is not necessary to say that these comments are eagerly awaited by the students, and we try to allow no delay in the reading and filing of the reports. The custom of having the reports handed to the demonstration teacher at the next following recitation aids in securing a prompt reading and criticism.

This directed *teaching* is all done in the Wisconsin High School. The directed and supervised *observation*, on the other hand, is done both here and in the Madison High School. The latter is in no sense a special course, but is a part of the departmental teachers' course, and time is allowed for it as for other preparation work assigned the class. I shall not describe in detail what was done this year, as modifications are already under way which, if completed, will make the conduct of the work somewhat different. Moreover, the work of the various departments has not been unified to any considerable extent in the observation of recitations, and what was done in German is not representative of the other departments. My only purpose here is to distinguish this observation work from the directed teaching described briefly above. The following gives a general idea of the nature of this work. The students were assigned definitely for a fairly large number of observations to each of as many teachers as our present arrangements made possible. They were required to report daily and in minute detail, according to an outline furnished by the university

instructor, on the progress of the recitation, giving devices, materials and subject-matter. The university instructor was constantly in touch with the work observed, and students were not permitted to hand in mere generalizations. The same system of reports was used as for the directed teaching, and they were gone over both by the teacher observed and the university instructor. There was no active participation in the class exercises. Comparisons of teachers observed were not allowed on the reports for obvious reasons, but candidates were urged to make comparisons in their own minds and to have grounds for the decisions reached. Insistence was put upon the use of politeness and tact toward the teachers of the demonstration classes, and not a single case of offense was reported, although this had been urged as a serious danger in such a system. It is my hope at some later time to present the results of this plan in detail, with samples of the reports and comments of the students. It has proved a valuable asset to teacher training.

The foregoing paragraphs will explain fully such statements in Mr. Weigel's article as: "Sometimes this work on the part of the student teacher is spontaneous and sometimes prepared," or: "The student may be asked to plan a lesson," statements which, without such explanation, would probably give to some the impression of a haphazard scheme without definite aim or value. It will also be clear that no student takes Education A without also taking a teachers' course in methods, texts, organization, etc. It might be added that a semester two-hour course in phonetics, a year two-hour course in advanced composition, one advanced literary course, and an elementary course in philology are required of major students by the Department of German, as a complement to which considerable work in general education courses is prescribed for all candidates for the university teachers' certificate.

The value of this additional training is so recognized by the students themselves that only a negligible number of Juniors majoring in German failed to enrol this year for the university teachers' certificate, which enrolment is a prerequisite for admission to Educational Practice next year. Those not so enrolling

are offered a limited opportunity for actual classroom experience in certain beginners' sections in the university proper.

As indicated before, this brief summary will serve as an introduction to later, more detailed discussions of this plan of training teachers. In the meantime, whatever questions as to detail are raised in the minds of those interested may be referred to Professor H. L. Miller, principal of the Wisconsin High School, who is in general charge of Educational Practice. Questions pertaining specifically to German or French may be referred to the writer.

THE WOOLLEY TESTS APPLIED TO A PREVOCATIONAL CLASS OF BOYS

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INTRODUCTION

The class referred to in this paper was composed of retarded boys from the public schools of Chicago, who were brought together under the management of the School of Education of the University of Chicago, partly because there was no other school to which they could go and partly to serve as material for investigation in prevocational education. The ages of the boys ranged from fourteen to seventeen years. None of them had completed the eighth grade. The curriculum which was planned for the boys was as follows: in the morning, from nine until twelve o'clock, they worked in the machine shop; in the afternoon, they were engaged in the regular classroom work—arithmetic, history, English, general science, and mechanical drawing.

For the purpose of understanding the boys better, each was given a careful examination in the Psychopathic Laboratory, under the direction of Dr. H. C. Stevens. The Woolley tests were used as a part of this examination, being given by the writer and Mr. E. B. Thomas. This article is a report of the results of these tests.

Prevocational education is described by Professor F. N. Leavitt as having a double purpose: (1) "to improve the courses of study in the elementary school, especially for those children who have not worked successfully under the prevailing methods found therein"; and (2) "to save for this education [in the higher schools] a much larger proportion of the school population, while at the same time giving information about, and practice in, some industrial work."[1] Prevocational education attempts to meet the pupil's needs by differentiating the courses in the upper grades, by reorganizing

[1] *Examples of Industrial Education*, p. 95.

the subject-matter, and by reconstructing the methods of teaching. But we need to have the problem defined still more. We need to know whether the retarded pupils are of normal intelligence and have not gotten along well because of poorly adapted school programs, or whether they are below the normal and have not been able to get along well with the regular work. The Woolley tests help to determine the capacities of such boys, thus making the problem of prevocational education more definite.

The Woolley tests consist of the following:

Physical tests.—

Height, after deducting for the heel.

Weight with coat off.

Vital capacity in cubic centimeters.

Grip for each hand taken with the Smedley dynamometer.

Steadiness for each hand.

Tapping. The final record consists of the number of taps for the first half-minute, and for the full minute, and for the fatigue of each hand. The index of fatigue is the difference in the number of taps in the first and third quarter-minutes, divided by the number of taps in the first quarter-minute.

Card sorting. The index is found by dividing the time by the accuracy.

Mental tests.—

Cancellation. A sheet of lower-case letters is presented, and the subject is asked to cross out all the *a*'s as quickly as possible. The index is found by dividing the time by the accuracy.

Immediate memory. Seven, eight, and nine place numbers are presented on separate cards and read aloud by the subject and examiner and then the numbers are written down from memory immediately.

Substitution. A card having nine geometric figures, each with a number, is placed in a convenient position. The subject is given pages of fifty geometric figures, like those on the card, and asked to place in these figures numbers which correspond to those on the card. For fourteen- and fifteen-year-old children, three practice pages and one memory page are given; for sixteen-year-old children, only two practice pages are given.

Completion of sentences. The beginnings of sentences were given to the subject to complete. A record was kept of the association time required for each sentence, of the number of sentences completed correctly, of the number of ideas used, and of the index of ideas, found by dividing the time by the number of ideas.

Opposites. Two lists of twenty words each were used—an easier list for the fourteen-year-old subjects than for the fifteen-year-old subjects.

TABLE I

PHYSICAL TESTS: Percentile Ranks for Subjects, According to the Norms for Working Children as Worked Out by Woolley and Fischer

SUBJECT	VITAL CAPACITY	GRIP		STEADINESS		TAPS IN 30"		TAPS IN 1'		TAPPING INDEX		CARD SORTING	AVERAGE (PERCENTILE)	RANK
		Right	Left	Right	Left	Right	Left	Right	Left	Right	Left			
C. M.	96	96	100	100	100	60	75	85	90	98	89	55	97.8	1
A. T.	98	(a)*	(a)*	70	80	100	100	100	100	100	85	35	86.8	2
F. S.	95	55	85	80	100	86	83	100	100	85	35	50	79.5	3
R. E.	83	55	55	60	95	40	100	60	100	70	80	74	72.7	4
J. D.	(a)*	90	95	94	95	30	95	45	95	60	75	10	71.2	5
R. W.	55	75	90	80	85	85	55	98	80	15	65	10	66.1	6
R. T.	100	70	75	80	85	20	20	35	40	85	100	80	65.9	7
R. B.	100	40	40	100	95	30	30	45	50	45	40	95	59.2	8
J. Mc.	(a)*	80	90	78	78	36	3	60	10	70	7	75	53.3	9
H. R.	50	30	30	100	95	50	20	70	30	95	1	50	51.7	10
F. R.	(a)*	25	30	90	90	10	70	20	90	5	90	45	51.4	11
G. D.	20	15	15	80	90	25	30	40	50	80	40	90	47.9	12
S. M.	35	30	15	90	85	10	15	20	25	100	100	20	45.4	13
E. R.	58	20	5	97	97	40	30	60	30	45	10	5	41.4	14
T. L.	50	20	10	96	70	30	30	45	45	20	70	5	40.9	15
D. S.	(a)*	(a)*	(a)*	1	1	5	1	15	1	60	100	1	20	16
Average	70	50	52.5	80.9	83.8	41.1	47.3	56.1	58.4	64.6	62.2	43.7	59.2	.....

* (a) Data is missing. The averages have been based upon the number of cases and tests.

TABLE II

MENTAL TESTS: Percentile Ranks for Subjects, According to the Norms for Working Children as Worked out by Woolley and Fischer

SUBJECT	CANCELLATION		MEMORY			SUBSTITUTION				OPPOSITES ACCURACY	SENTENCES				AVERAGE (PERCENTILE)	RANK
	Index	Accuracy	7 Pl.	8 Pl.	9 Pl.	I	II	III	IV		Begun in 2″	Ideas	Index	No. Correct		
F. S.	70	90	100	100	90	20	75	(a)*	100	(a)*	30	100	65	60	75	1
R. T.	15	50	98	98	100	65	60	(a)*	86	(a)*	80	100	100	37	74.1	2
E. R.	60	80	98	7	45	85	34	65	54	100	90	95	100	60	69.5	3
J. D.	5	40	15	25	35	80	95	95	90	100	25	95	95	80	62.5	4
G. D.	20	60	40	55	30	80	90	90	80	45	40	75	80	30	58.2	5
R. E.	15	15	45	55	50	65	95	95	90	95	10	70	25	30	53.9	6
R. B.	55	70	60	5	55	5	5	5	5	80	80	90	85	80	48.6	7
R. W.	20	100	30	80	60	30	15	(a)*	20	(a)*	5	100	70	40	47.5	8
C. M.	5	98	98	20	80	45	40	10	15	15	35	95	80	20	46.9	9
H. R.	20	50	5	48	35	30	95	70	65	98	1	75	20	20	45.1	10
F. R.	50	60	10	30	70	20	45	75	84	2	25	75	23	30	42.8	11
T. L.	45	77	15	25	15	15	70	90	85	10	1	70	30	40	42	12
J. Mc.	85	90	1	20	1	45	70	(a)*	80	(a)*	10	55	10	20	40.4	13
A. T.	65	20	5	15	40	1	55	(a)*	45	(a)*	20	65	75	60	38.8	14
S. M.	5	80	20	50	45	50	70	70	1	20	1	90	50	30	33.5	15
D. S.	30	55	1	1	1	5	5	(a)*	40	(a)*	10	25	1	2	14.3	16
Average	35.3	64.7	39.9	39.5	46.9	40	57.4	66.5	58.7	56.5	28.8	79.7	56.8	39.9	47.4	.....

* (a) These subjects were sixteen years old. For this age the opposites test is omitted and there are but two practice series in the substitution test.

In giving the tests, the methods given by Dr. Woolley and Mrs. Fischer in *Mental and Physical Measurements of Working Children* (Psychological Monograph, No. 77), were followed as accurately as possible. Preliminary practice was obtained by testing a number of university students.

TABULATION OF RESULTS

Table I shows the percentile ranking for each subject in each physical test, according to the norms for working children in Cincinnati. These are presented instead of the scores for each test so that individuals of different ages can be directly compared with one another. A rank of 60 per cent in the table means that there are 40 per cent who did better and 60 per cent who did worse than the individual in question.[2]

In the same way, Table II shows the percentile ranking for each subject in each mental test.

Since only part of the norms for school children were available, a table based on these norms had to be omitted, but enough was gone over to yield some definite results, which will be mentioned later.

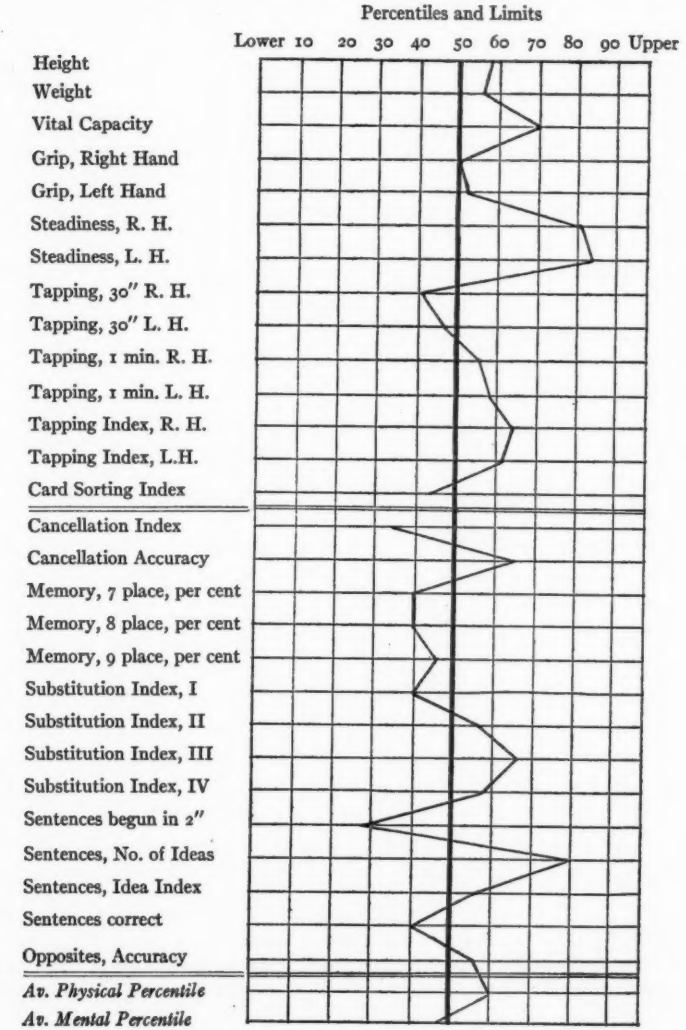
Psychograph I shows the percentile ranking of the group in an average of each test. It will be noticed that the group ranks very high in steadiness, and that, excepting the scores for the number of taps in 30 seconds and the card sorting, the physical standing of the group is as high or higher than the average for working children. Taking the average of all the physical tests, we find that the class is up to the sixtieth percentile of working children. As nearly as could be estimated from data at hand, this average is about the median for school children.

As regards mental standing the results are quite different. The average of the mental tests shows the class to be slightly below the average of working children. In the cancellation of *a*'s, while

[2] The norms for fourteen- and fifteen-year-old working children can be found in "A New Scale of Mental and Physical Measurements for Adolescence, and Some of Its Uses," by Helen Thompson Woolley, in the *Journal of Educational Psychology*, November 1915. The norms for sixteen-year-old working children and for fourteen- and fifteen-year-old school children have not been published, but were obtained through the courtesy of Dr. Woolley.

PSYCHOGRAPH I. GROUP

BASED UPON THE AVERAGE OF THE PERCENTILES FOR EACH TEST



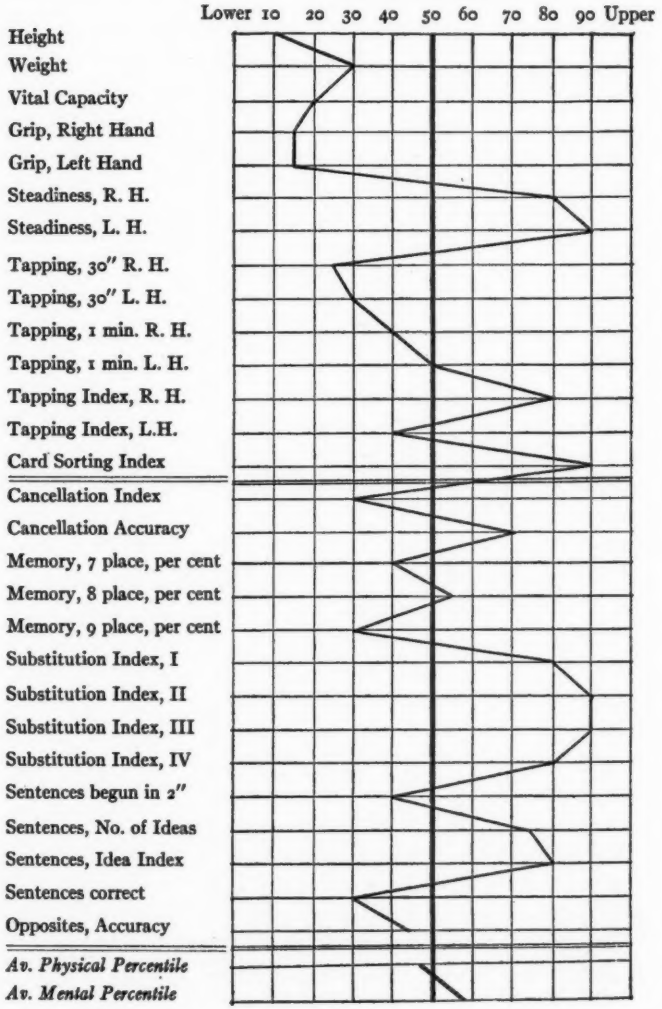
very accurate, they were so slow that the index, which is found by dividing the time by the accuracy, is low. The accuracy seems to have been gained at the expense of speed. Immediate memory, found to correlate highly with school standing, is low. This agrees well with the fact that the boys did not get along well in school and were retarded. The substitution test is very significant. The first page is much below the median, the second page is above, the third page is still higher, and the last page is above, but not so high as the third page. The first page indicates a slow adjustment to a new situation. The indices of pages two and three indicate that great gain can be made through practice. But the practice is not well retained, as is shown in the drop on the third page. On the whole, the test shows a medium amount of ability to learn a routine piece of work. In the sentence test, the class was below the median in the number of sentences begun in two seconds, indicating slow association. The total number of ideas was high, but this is of doubtful significance, as the results for feeble-minded children may give a large number of ideas; but the idea index, found by dividing the time by the number of ideas, shows again that the class is very slow. The number of sentences correctly completed reflects the school training. This agrees with the record of the boys in school.

Were we to compare this group with school children, we should find them much below the latter mentally.

Psychographs II and III represent two different types of boys. In general, the boys of this group are represented by C. M. in Psychograph III, who is superior physically and inferior mentally, but there are some, like G. D. in Psychograph II, who are better mentally than physically. In this group, 7 are of the type of C. M., 2 are of the type of G. D., 4 are above the median both physically and mentally, and 3 are below the median both physically and mentally. The presence in the class of the 4 boys whose rank is above the median needs further explanation: one has an uncontrollable temper and very little will power; one is sickly; another is absent from school a great deal of the time; and the other has been in the class so short a time that he is not well known.

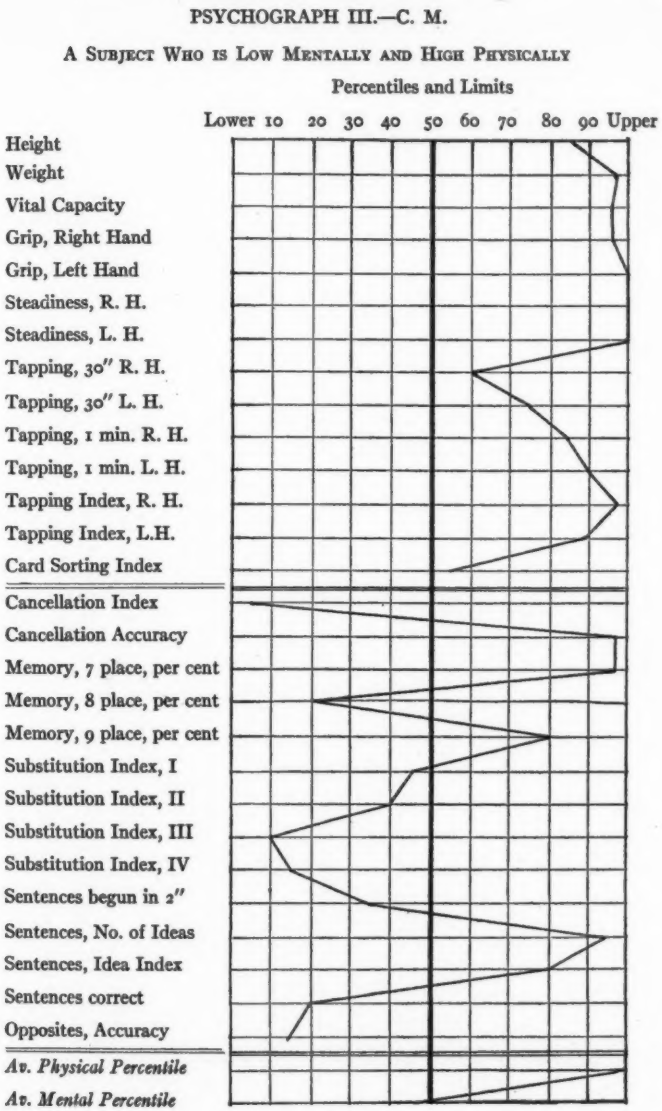
PSYCHOGRAPH II.—G. D.

A CASE HIGH MENTALLY AND LOW PHYSICALLY



PSYCHOGRAPH III.—C. M.

A SUBJECT WHO IS LOW MENTALLY AND HIGH PHYSICALLY



Concerning the prospects of the types just mentioned, Dr. Woolley makes the following comment:

> The individuals who stand consistently low in both respects seem destined to simple manual labor, or low grade industrial positions, provided they have the necessary physical strength. Those who are very lacking in mere strength as well, have slim prospects of being able to earn a living in the modern world. The group whose mental endowment is rather poor, or medium, but whose manual ability is good, should be prepared for the skilled trades. Those who have a medium endowment of both kinds should be guided toward the great mass of secondary positions in business and industry. Those whose mental development is exceptionally good, but who are lacking in manual skill, should be directed toward such professions as law, the ministry, literary pursuits, the non-experimental academic branches, the higher positions in business and finance, and some types of social work. Those who are gifted with exceptional ability in both directions, manual and mental, should be guided to such professions as medicine, architecture, engineering, the experimental sciences, the arts, and certain types of social work.[3]

The kind of work which these boys are best able to do is physical. The kind of education they should have is that which will prepare them for the skilled trades. They are not likely to go into the higher schools, so it is best that what schooling they have should be of immediate, practical value. Such training is the aim of prevocational education.

CORRELATIONS

In dealing with so few cases it is difficult to find a method which gives reliable results of correlation. A number of methods were tried, but finally the Spearman method was used, but checked by plotting and by the Pearson method. Judged by the plotting, the correlation in all cases would have been considerably higher if one or two extreme cases could have been eliminated. All Spearman coefficients have been converted into Pearson values by the formula

$$r = \sin\left[\frac{\pi}{2} R\right].$$

The rankings for the mental and physical tests were obtained from Tables I and II. For the school work, the teachers were

[3] "A New Scale of Mental and Physical Measurements for Adolescents and Some of Its Uses," *Journal of Educational Psychology*, November, 1915.

asked to rank the pupils. The ranking for the shopwork was kept by itself, but the rankings for the arithmetic, the English, the history, and the science were combined into a single set of rankings by adding the ranks of the various teachers and dividing by the number of ranks so added. Lack of acquaintance with some of the boys made a ranking impossible for one of the teachers. Table III shows the ranks assigned by the different teachers, and the final, or composite, rank.

The most striking correlations were between mental tests and school work and between physical tests and shopwork. The correlation of the former, translated into terms of the Pearson coefficient, is 0.38, the latter is 0.43. There was no correlation

TABLE III

RANKING IN SCHOOL WORK

Pupil	Science	Arithmetic	English	History	Total	Average	Final Rank	Shop
J. D.....	2	5	3	1	11	$2\frac{3}{4}$	1	4
G. D.....	1	3	10	5	19	$4\frac{3}{4}$	3	5
F. R.....	3	2	7	7	19	$4\frac{3}{4}$	3	9
F. S.....	5	1	4	9	19	$4\frac{3}{4}$	3	12
H. R.....	10	6	1	4	21	$5\frac{1}{4}$	5	1
A. T.....	6	9	6	3	24	6	6	2
R. W....	4	7	13	2	26	$6\frac{1}{2}$	7	3
R. T.....	7	4	12	6	29	$7\frac{1}{4}$	8	8
R. B.....	11	.....	2	11	24	8	9	11
E. R.....	8	.....	9	8	25	$8\frac{1}{3}$	10	15
D. S.....	12	8	8	12	40	10	11	6
C. M.....	9	11	14	10	44	11	12	7
S. M.....	15	12	5	14	46	$11\frac{1}{2}$	13	13
T. L.....	13	10	15	13	51	$12\frac{3}{4}$	14	14
J. Mc....	14	.....	11	15	40	$13\frac{1}{3}$	15	10

between mental tests and shopwork and none between physical tests and school work. School work correlated more highly with page four of the substitution test than with any other mental measure, having a correlation of 0.47. Shopwork correlated well with the tapping index, 0.35, and with the number of taps in one minute, 0.38, but was most highly correlated with the strength of grip, 0.54.

SUMMARY AND CONCLUSION

These tests show that these boys are:

1. Physically superior and mentally equal to working children.

2. Physically equal and mentally inferior to school children.
3. Able to learn routine work well.
4. Slow but accurate.
5. The material out of which skilled tradesmen and mechanics can be made.
6. In need of the kind of instruction offered through pre-vocational education.

CORRELATION BETWEEN AMOUNTS OF HOME STUDY AND CLASS MARKS

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Home study involves so many problems of child, school, and home that the difficulties of solution are baffling. However, a scientific study of the whole question is made urgent by the present confusion arising from (1) the home-study requirements of most American and European schools above the primary division; (2) the criticisms of many hygienists, psychologists, and administrators as to the quantity or quality of home study; and (3) the recent abolition of home-study requirements in a growing but still small number of American schools, generally with some increase, redistribution, or modified use of the study time in school. What is needed is some proof, rather than opinion or practice, on one side or the other. But such proof, of more than individual or local significance, is surrounded and conditioned by so many varying factors as to be almost inaccessible.

The November *School Review* published "A Study of Home Study," based upon records from 5,021 grammar- and high-school students in 25 schools or school systems in Virginia, as to the amount of time devoted in a typical week to the home preparation of school lessons. The care used to get accurate data was there explained in detail, and the results were interpreted without premature general conclusions. The present study carries the investigation one step farther and takes the risk of stating two tentative conclusions.

Though separate in itself, this study uses the previous home-study records from the 4 high schools with the largest representation, here amounting to a total of 1,299 records.—Charlottesville, Lynchburg, Richmond, and Roanoke. The other high-school records are not included on account of the unreliability of correlation results,

especially those of small degree, if only a few cases are represented. No group here studied has less than 57 students. Grammar-school records are not included on account of their various marking systems and symbols; but there is added to this report a rough comparison between the amounts of home study and the A, B, C marks of 2 Richmond schools.

An average of each student's marks was taken from the school report for the month in which the week's record of home study was made. Both the mark and the amount of home study for each student refer to practically the same school requirements, though, of course, the mark refers also to the work of 3 other weeks. As the marks were collected, without previous suggestion, months after the home-study records, there was no possibility of the former being influenced by a teacher's expectation of any use of them in comparison with the latter. These marks are probably based upon as accurate, or as inaccurate, grading of students' school work, as is the case in most schools of similar type. There is here no special defense of the marks used, but simply a belief that nearly 6,000 marks from over 100 teachers for 1,299 students in 4 schools are sufficiently serviceable to justify the general conclusions drawn from the 27 groups in the table.

The home-study records of 11 Charlottesville and 3 Roanoke students previously represented are here omitted, because the marks of these students were lacking in the school files. As 52 records from Lynchburg had to be omitted for this reason, the Lynchburg representation was further reduced by the omission of 13 records from students with 3 marks each and a home-study average of 500 minutes, and by the omission of 58 records with 5 (1 with 6) marks each and a home-study average of 564 minutes, thus leaving 254 records from students with 4 marks each and a home-study average of 443 minutes. The further reduction was made in order to test whether the resulting uniformity in marks, and presumably in studies, would decrease the deviations and correlations as compared with those in the 3 other schools. There is a far-from-general tendency for students, in comparison with their class averages, to study at home less or more according to whether they have less or more studies, without the result of a

corresponding variation in marks. The following figures from Table I are illustrative pro or con: of the 57 first-year students in Charlottesville with home study and mark averages respectively of 612 and 86, 21 with more than 4 marks averaged 607 and 86; of the third-year students in Lynchburg, 24 with 4 marks averaged 444 and 84, and 25 with 5 marks averaged 551 and 84; of the 101 third-year students in Richmond, with averages of 766 and 82, 6 with less than 5 marks averaged 761 and 81, and 19 with more than 5 marks averaged 784 and 79.

DEVIATION

The large standard deviations from group averages of home study, as shown in the table, reveal a lack of school standards and control of the situation, even when allowance is made for uncontrollable variations in student, home, teacher, program, supervision, and subject. The quantity of home study is, of course, less important than the quality; but the time element should not and would not be so little regarded, if the school assigned its lessons more carefully and tested more closely the result of its assignments. Over and above its pedagogical significance, this time element is specially important in its influence upon hygienic development, domestic companionship, and social adaptation and recreation.

The deviations from class averages of home study ought to be smaller than those from school averages, because each class has its own requirements as to curriculum and program and possibly as to study, and is more homogeneous as to age, advancement, etc. The previous report for 13 high schools showed an increase in home-study averages from the first to the third year and a slight decrease in the fourth year below the third. It would seem that a combination of progressive class differences into a school average would naturally produce a larger deviation than those for the classes separately. But the classes here studied have standard deviations about equal to those of their respective schools. The average[1] of the 4 first-year deviations in home study is 84 per cent

[1] Of course, the average of group deviations is different from the deviation of a group combining the separate groups; but the former ought to be more valuable for our comparison than the latter.

TABLE I

	Number Records	Average Minutes	Standard Deviation	Average Marks	Standard Deviation	Correlation Coefficient	Probable Error
Charlottesville—							
First year: total	57	612	265.757	86	6.000	.208	.0889
School: total	155	687	318.308	87	5.292	.109	.0536
Lynchburg—							
First year: boys	54	344	174.697	81	8.888	−.005	.0918
First year: girls	81	514	235.268	82	7.746	−.069	.0750
First year: total	135	446	229.539	81	8.307	−.034	.0580
Second year: total	62	443	244.244	80	7.937	.033	.0856
School: boys	102	378	213.811	80	8.124	.100	.0980
School: girls	152	487	225.187	82	7.810	−.039	.0546
School: total	254	443	226.192	82	7.874	.016	.0423
Richmond—							
First year: Latin	108	515	206.930	85	6.000	.006	.0649
First year: Latin—girls	61	536	197.962	85	6.325	−.095	.0856
First year: elective	71	459	227.365	81	5.099	−.113	.0791
First year: total	264	479	205.920	82	6.245	.088	.0412
Second year: Latin	67	605	289.543	85	6.633	.191	.0794
Second year: Latin (4 marks)	58	633	297.738	84	6.708	.212	.0846
Second year: boys	74	472	226.164	80	6.000	.002	.0784
Second year: girls	97	635	306.176	83	6.164	.122	.0674
Second year: total	171	566	286.761	81	6.481	.155	.0504
Third year: total	101	766	302.200	82	5.657	.048	.0670
Fourth year: total	75	698	310.467	84	5.657	.253	.0729
School: total	611	577	282.301	82	6.083	.136	.0268
Roanoke—							
First year: total	129	567	267.302	85	5.745	.374	.0511
Second year: total	68	630	323.929	85	8.124	.013	.0817
School: boys	110	522	337.782	85	6.708	.134	.0631
School: girls	169	675	318.082	87	6.325	.205	.0497
School: total	279	615	326.928	86	6.557	.160	.0403
Four Schools—							
Fourth year: total	186	625	316.951	86	5.831	.059	.0493

of the corresponding average for the 4 schools, that of the 3 second-year deviations is 102 per cent of that for the 3 schools, and the third- and fourth-year deviations in Richmond are 107 and 110 per cent, respectively, of that for their school.

The home-study deviations are generally larger from larger averages, on account of the wider range of probable variations; but the percentages which the deviations make of the respective group averages from which they are calculated are more nearly constant and more suitable for comparison. For instance, the average of the deviations in the 4 first-year groups is 46 per cent of the average of the 4 first-year averages, while the average of the deviations in the 4 school groups is 50 per cent of the average of the 4 school averages. The corresponding percentages for the 3 second-year groups and the 3 school groups are 52 and 51; for the third and fourth years in Richmond and for the school total they are 44, 39, and 40. Even a cross-section of the 4 schools, made by combining all the fourth-year students into one group, gives a corresponding percentage of 51—about what might be expected in a single school or class. (The 8 omitted Lynchburg records for the fourth year are included in this group, to give a similar representation for Lynchburg as to variation in the number of studies taken by students.)

The great difference between boys and girls in home-study averages, which in the groups here compared are 35 per cent greater for the girls, differentiates the sex groups from each other and from the inclusive mixed groups. However, this fact does not decrease the deviation in home study in the sex groups as compared with the mixed groups. The average standard deviations for 2 school groups of boys and for 2 of girls, respectively, are 100 and 98 per cent of the corresponding average for the 2 school totals; and the average standard deviations for 2 class groups of boys and for 2 of girls, respectively, are 78 and 105 per cent of the corresponding average for the 2 class totals. Only in the class groups of boys is less deviation noticeable, and this is due to their small group averages. If we compare the percentages which standard deviations make of their group averages we have for the above mentioned school groups 61 per cent for the boys, 47 for the girls, and 52 for the

totals; and we have for the class groups 49 for the boys, 47 for the girls, and 51 for the totals.

Further still, in Richmond the first-year Latin and elective groups, respectively, have a standard deviation which is 105 per cent of that for the first-year total and a percentile deviation of 40 and 50 as compared with 46, in spite of the greater homogeneity of these subclass groups as to curricula, etc. These results are more noticeable because all the first-year students are equal in number of marks and presumably of studies, each student having 5. The second-year Latin group has a standard deviation which is 101 per cent of that for the second-year total, and a percentile deviation of 48 as compared with 51. Even if we confine this group to the 58 students having 5 marks each, the standard deviation is 104 per cent of that for the second-year total, and the percentile deviation is 47 as compared with 51. And, finally, the first-year Latin girls, the most homogeneous group here studied, have a standard deviation which is 96 per cent of that for the first-year Latin total and a percentile deviation of 37 as compared with 40.

However much we have divided students into groups with more and more elements of homogeneity, we can make little substantial reduction in the standard deviation from the group averages for home study.[1] The greater homogeneity as to curricula, program, advancement, sex, etc., has little influence upon deviations in amount of home study. The standard deviations in the smaller groups should really be a little larger than those here given—for instance, 2 more in each of the 4 smallest class groups—if we use a modified formula for small groups.

The elimination of 71 records from Lynchburg, so as to make all the students here included have 4 and only 4 marks, does not reduce its group deviations in comparison with those of the 3 other schools. The average standard deviation for the first year in Lynchburg is 51 per cent of the first-year average, while the corresponding percentages for the 3 other first-year groups are 43, 43, and 47; the percentages for the second year in Lynchburg and for the 2 other

[1] The previous report included a study of average and of standard deviations from school averages and medians; and now it is seen that the disproportionate class representation in the different schools did not seriously reduce the significance of the results.

second-year groups are 55, 51, and 51; the percentages for the Lynchburg total and for the 3 other totals are 51, 46, 49, and 53.

The following figures emphasize the practical significance of the variations in amount of home study for the week, and, if divided by 5, in average time spent in the home preparation of lessons for each school day. The figures are based (1) upon the average of the group averages and (2) upon the probable error calculated by means of the average of the standard deviations from these group averages. The average amount of home study for the 4 first-year classes is 8 hours and 41 minutes, but about half of the students study at home less than 5 hours and 29 minutes, or more than 11 hours and 53 minutes; the average for the 3 second-year classes is 9 hours and 6 minutes, but about half of the students study at home less than 5 hours and 54 minutes, or more than 12 hours and 18 minutes; the average for the 2 class groups of boys is 6 hours and 48 minutes, but about half of the students study at home less than 4 hours and 33 minutes, or more than 9 hours and 3 minutes; the average for the 2 class groups of girls is 9 hours and 34 minutes, but about half of the students study at home less than 7 hours and 31 minutes, or more than 11 hours and 37 minutes; the average for 3 Richmond subclass groups is 8 hours and 46 minutes, but about half of the students study at home less than 6 hours and 18 minutes, or more than 11 hours and 14 minutes; the average for the 4 schools is 9 hours and 40 minutes, but about half of the students study at home less than 6 hours and 25 minutes, or more than 12 hours and 55 minutes.

The average for the 13 high schools in the previous report was 10 hours and 37 minutes, but about half of the students study at home less than 7 hours and 18 minutes, or more than 13 hours and 54 minutes. Furthermore, the average for the lowest 10 per cent of the students in each of these 13 high schools was 65 per cent, or 6 hours and 55 minutes, below the average of 10 hours and 36 minutes; and the average for the highest 10 per cent was 93 per cent, or 9 hours and 53 minutes, above that average. The averages of the lowest and the highest 10 per cent in the 4 schools here represented (3 with slightly different averages) were respectively 68 per cent, or 6 hours and 41 minutes, below, and 105

per cent, or 10 hours and 16 minutes, above the average of 9 hours and 46 minutes for the 4 schools.

Before correlation is discussed, a comparison should be made between the deviations in home study and those in marks. The mark deviations in the more homogeneous groups are also similar to those in the less homogeneous groups; but this similarity is not as noticeable as in the case of home study, because there is less range possible in marks, the group averages are more nearly alike, and the class averages do not progress uniformly from year to year. If any definite influence of home study upon school work is assumed, and such influence is generally assumed where home study is required, then the deviation from the home-study average ought to be reflected in the deviation from the mark average in the same group. But this does not seem to be the fact. Though deviations in minutes of home study on a scale of more than one thousand cannot be directly compared with deviations in marks on a scale of one hundred, we can compare the respective percentages which each deviation in the same group makes of the group average from which it is calculated. For instance, in the first year in Charlottesville the standard deviation in home study is 43 per cent of the home-study average, and the standard deviation in marks is 7 per cent of the mark average; in the first year in Lynchburg the percentages are 51 and 10 respectively, in Richmond 43 and 8, in Roanoke 47 and 7. In the second year the percentages are 55 and 10, 51 and 8, 51 and 10; in the 2 class groups of boys and the 2 of girls, 51 and 11, 48 and 7, 46 and 9, 48 and 7; in the 3 Richmond subclass groups, 50 and 6, 40 and 7, 48 and 8; in the 4 schools, 46 and 6, 51 and 10, 49 and 7, 53 and 8. The average of the percentages in the case of home study is 6 times the average of the percentages in the case of marks. This great difference in the deviations shows that both cannot represent actual variations in school work, even when allowance is made for other influences which may reduce the correspondence between the two deviations.

Until school administrators and teachers reduce the deviations from class and subclass averages of home study, they can claim little knowledge or control of the situation. And, whether right or wrong in itself, the abolition of home study may be no solution of

home-study problems, but may be adopted in a given system as a way of dodging rather than solving these problems. An objection might be raised that the deviations in the schools here studied are not typical of the better American schools; but it is very improbable that these 4 superior schools show an unusual inferiority in home-study control.

Some high schools have time requirements for home study, which are easy to make but difficult to put into practice, especially in departmental systems. It is yet to be proved how much the deviations are decreased thereby. In fact it is difficult for schools to know what their home-study averages and deviations really are, as occasional questionings or questionnaires issued by teachers or principals do not generally collect accurate data about home study. Students, and probably their parents, fear that their answers to such questions may influence the school judgment of them or their work, and consequently there is a tendency to study more in expectation or to exaggerate in retrospect, so as to make a creditable showing; student calculations, however conscientious, are usually inaccurate as to the amount of time spent in home study, especially as to a general average; chance variations tend to vitiate the data given for one day or for one subject; most officials are unable or disinclined to interpret the variables in home-study data according to the necessary statistical methods, and even an elaborate and tedious amount of statistical work will produce only suggestive rather than exact conclusions. Yet the difficulties must, in an efficient educational system, be overcome sooner or later.

FIRST CONCLUSION

Measurement and treatment of individual variations in amount of home study.—The first tentative conclusion of this study can now be stated as follows: If in a given class or subclass a fairly accurate average of the usual amount of home study per week or per day and the individual deviations therefrom can be found by continued test and conference or by expert diagnosis, then some calculations (preferably but not necessarily the standard deviation and the probable error) should be made in order to find out the amount of deviation and then the probable limits above and below the

class average which divide the 50 per cent of students with less deviation from the 50 per cent with more deviation. In large groups the median should be used rather than the average. (See the previous report.) The half of the class which shows the greater deviation should then receive additional and individual treatment as to test, consultation with child and home, supervision of school study, stimulation, reclassification, etc., in order to reduce the individual deviations—due to variations in child, home, teacher, program, supervision, or subject—to amounts within the limits of the deviations of the other half of the class, i.e., the probable error. Although individuals in the latter half may need the treatment suggested above, the general procedure should begin with the former half. With low class averages the greater deviations below the average need more attention than equal deviations above it, and with high class averages the greater deviations above need more attention than equal deviations below; in the first case deviations below may imply neglect, in the second case deviations above may imply strain. As any change in deviation may produce a change in class average, the reductions suggested may produce such a different class average that new studies will be made necessary from time to time. If at any time the class average is found to be too low for the desired efficiency in class work or for other educational aims, or is found to be too high for the health or the family and social life of as many as one-fourth of the class, a preferred average can be set and explained to the class, and the deviation and probable error can be calculated from that average, or an entirely new study can be made for this purpose. It would be wiser in most cases to make several such studies, with the subsequent treatment, before deciding upon a standard average amount of home study for the class. This average would be far more valuable than a time requirement based upon guesses or arbitrary criteria.

In these studies the deviation considered satisfactory for a class or subclass should not be graded on an absolute scale, but only in proportion to the amount of the class or subclass average—in other words, as some percentage of that average. The standard deviation should not exceed 25 per cent, and should be kept as much less as possible, though with constant regard for the inevitable and

even healthful variations within a class. This maximum means that a class with an average of 8 hours and 20 minutes per week would have a standard deviation not over 2 hours and 5 minutes, and also that the 50 per cent of students with the greater deviation would study at home less than 6 hours and 56 minutes or more than 9 hours and 44 minutes. A 10 per cent standard deviation from this average would be only 50 minutes, and the probable error only 34 minutes.

CORRELATION

The present study is concerned more with correlation between amounts of home study and class marks than with the deviation from home-study averages, though the two problems are closely related. Before the correlation figures are discussed, it may be well to illustrate in part their significance in this study. In a given class of students, some may study at home less than the average time for the class and receive less than the average mark for the class (positive correlation); some may study at home more than the average amount and receive more than the average mark (positive correlation); some may study at home less than the average amount and receive more than average mark (negative correlation); and some may study at home more than the average amount and receive less than average mark (negative correlation). Furthermore, in each of these fractional groups, some students may vary more than the other students from the home-study average or the mark average or both of the averages of the class, and may therefore have a greater positive or negative correlation, according to the nature of the correlation of their fractional group. But what correlation is there in the class as a whole? Because the correlation of one student or of any part of the class cannot be fully representative for the class as a whole, the answer to this question has to combine all the individual correlations into a statistical expression for the group. These coefficients, as percentages of complete positive or negative correlation, range from 0 to $+1$ or from 0 to -1. The probable error of the coefficient for any group is the range of probable variation of half of the group above or below the coefficient, the other half varying beyond these limits. For instance, in the first year in Charlottesville the correlation is $+0.208$, but

about half of the students have a correlation below +0.119 or above +0.297; in the first year in Lynchburg the correlation is −0.034, but about half of the students have a negative correlation greater than −0.092, or a positive correlation greater than +0.024. In the second illustration especially the range of variation of the individual correlations within the class is so great in comparison with the coefficient for the class as a whole as to render the coefficient uncertain and therefore of little value by itself.

The main dangers in correlation statistics in studies like the present one are (1) that so many different elements may be combined in one group that the number or degree of extraneous influences may decrease or increase, respectively, the correlation coefficient below or above the actual correlation existing between amounts of home study and class marks; and furthermore (2) that any correlation may be considered as necessarily expressing a positive or a negative causal relationship between amounts of home study and class marks, whereas a positive correlation may also be due in part or even in whole to one or more extraneous influences upon both series, or separate influences upon each, in somewhat the same direction, or a negative correlation may also be due in part or even in whole to one or more extraneous influences upon both series, or separate influences upon each, in somewhat opposite directions.

Consideration of these dangers has led the author to divide his data into groups of more and more homogeneity as to curricula, program, age, advancement, sex, etc., in an effort to reduce thereby the number or degree of differentiating influences upon amounts of home study and, to a less degree, upon class marks. The greater the number of these influences the less probably would be the degree of correlation, because there would be more possibilities of these influences acting upon one or both series in different than in the same direction. But actually the more homogeneous groups do not seem to have a smaller number or degree of differentiating influences upon one or both series, as is shown by the fact that the standard deviations in both series are about the same in the more homogeneous as compared with the less homogeneous groups. And if similar deviations in class groups, for instance, as compared

with those of school groups, are due to a similar number or degree of these influences, there will probably be a similarity between the class groups and the school groups in their respective correlations between amounts of home study and class marks. For we have no right a priori to suppose that the differentiating influences would decrease or increase the correlations in the class groups any more or less than the differentiating influences would decrease or increase the correlations in the school groups. This does not mean that single groups would not differ from each other in degree of correlation and differ disproportionately to their respective deviations, but that in the long run similar group deviations would tend to produce similar group correlations between amounts of home study and class marks, if other conditions remained unchanged.

As a whole, the table does not show greater correlation in the more homogeneous as compared with the less homogeneous groups. The average[1] of the 4 first-year correlations is 0.159 (P.E. 0.0598), while the average of the 4 school correlations is 0.105 (P.E. 0.0407); the average of the 3 second-year correlations is 0.067 (P.E. 0.0695), while the average of the 3 school correlations is 0.104 (P.E. 0.0365); the averages of the correlations of 2 school groups of boys and 2 of girls, respectively, are 0.117 (P.E. 0.0805) and 0.083 (P.E. 0.0521), while the average of the 2 school correlations is 0.088 (P.E. 0.0143); the averages of the correlations of 2 class groups of boys and 2 of girls, respectively, are −0.001 (P.E. 0.0851) and −0.026 (P.E. 0.0712), while the average of the 2 class correlations is 0.060 (P.E. 0.0542); the average of the 3 subclass correlations in Richmond is 0.028 (P.E. 0.0745), while the average of the 2 class correlations is 0.121 (P.E. 0.0548). Most of the more homogeneous groups have smaller coefficients than do the less homogeneous groups.

The practical meaning of the smallness of the correlations is further emphasized by the following figures. As most of the coefficients and many of the groups are small enough to make large

[1] Of course, an average of group correlations is different from the correlation of a group combining the separate groups; but the former ought to be more valuable for our comparison than the latter. An average of probable errors suffers more than an average of correlations from being out of relation to the number of cases involved.

probable errors in comparison with the coefficients, it will be well to interpret the correlations in terms of the probable limits below and above the respective coefficients, which include one-half of the students of each group, the other half varying below and above these limits. For the following illustrations the three highest and the three lowest correlations are used: the first year in Roanoke, from 0.323 to 0.425; the fourth year in Richmond, from 0.180 to 0.326; the second-year Latin in Richmond, with 5 marks for each student, from 0.127 to 0.297; the first-year girls in Lynchburg, from −0.144 to +0.006; the first-year Latin girls in Richmond, from −0.181 to −0.009; the first-year elective in Richmond, from −0.192 to −0.034. It is noticeable that these extremes are all for class and subclass groups. The average 0.084 (P.E. 0.0656) for all the 27 groups in the table include so many different elements and so many students more than once that it has little definite value, but it shows the tendency of the correlations.

Furthermore, the small positive coefficients are not the result of a few extreme negative correlations which pull down the positive correlation for each group but do not really represent the group as a whole. They are the result of a surprisingly large proportion of individual negative correlations. The number and percentage of the positive, negative, and zero correlations in each group have been computed. The following percentages are for the 3 groups with the highest and the 3 groups with the lowest percentage of individual positive correlations: the first year in Roanoke, 64, 31, and 5; the fourth year in Richmond, 63, 29, and 8; the second-year girls in Richmond, 59, 34, and 7; the school group of girls in Lynchburg, 43, 50, and 7; the first year in Lynchburg, 43, 54, and 3; the first-year girls in Lynchburg, 40, 53, and 7. The average percentages for all the 27 groups are 51, 43, and 6. There is an irreducible minimum of uncontrollable variations in child, home, teacher, program, supervision, subject, or marks, which put some students behind in marks, even though they study at home more than the average amount, and other students ahead in marks, even though they study at home less than the average amount. But this irreducible minimum ought not to affect as many of the students as it does.

The significance of these figures is increased by the result of a rough calculation with the A, B, C marks of the fifth, sixth, and seventh grades in two Richmond grammar schools. These marks were given for class work as a whole and not for the subjects separately. Of 149 students from school B, 60 per cent of the 40 students with A studied at home less and 40 per cent studied more than the class-average amount; 58 per cent of the 80 students with B studied at home less and 42 per cent more than the class-average amount; 56 per cent of the 21 students with C studied at home less and 44 per cent more than the class-average amount. For 147 students from school F, the corresponding percentages are as follows: of the 37 students with A, 62 and 38; of the 96 students with B, 50 and 50; of the 14 students with C, 50 and 50. For 296 students from schools B and F, the corresponding percentages are as follows: for the 67 students with A, 54 and 46; for the 176 students with B, 53 and 47; for the 53 students with C, 53 and 47. Of the 85 students in school B, who studied at home less than the average amount, 21 per cent received A, 54 per cent received B, and 25 per cent received C; of the 64 students who studied at home more than the average amount, 19 per cent received A, 53 per cent received B, and 28 per cent received C. The corresponding percentages for school F are as follows: for the 78 students who studied at home less than the average amount, 29, 62, and 9; for the 69 students who studied at home more than the average amount, 20, 70, and 10. The corresponding percentages for the schools B and F are as follows: for the 163 students who studied at home less than the average amount, 25, 58, and 17; for the 133 students who studied at home more than the average amount, 19, 62, and 19. The marks do not reflect the minus or plus deviations in home study, or vice versa.

What is the minimum positive correlation between amounts of home study and class marks necessary to justify home study? For the following among many reasons no definite answer can be given. Home study must be judged by its quality as well as by its quantity; a correlation between amounts of home study and class marks does not necessarily express the influence of those amounts upon class work; this influence is the most generally

accepted but not the only purpose of home study; this influence is but one of several influences upon class work; the marks may not express an accurate grading of class work and indirectly of the amount of these several influences upon it; deviations in home study and in class marks interfere with the calculation of an accurate correlation between them; general conclusions for a group will not apply to many individuals in that group; different communities, schools, grades, teachers, subjects, topics, methods, etc., may need different correlations to justify home study. However, the minimum for a group as a whole, especially for a class or subclass, should probably be not less than 0.20 with a probable error of not more than 0.08. As only 5 of the 27 groups here studied are above this minimum, as 3 out of the 5 are very little above it, as 6 out of the 27 have negative correlations, and as the average for the 27 groups is less than 0.09, with a probable error above 0.06, the general defense of home study is far from strong in these schools. There is as yet no evidence that this defense is stronger in other schools.

SECOND CONCLUSION

A statistical proof or disproof of the value of home-study practice.——The second tentative conclusion of this study can be stated as follows: Each phase of the home-study tradition so prevalent in our schools must be scientifically defended or given up. The difficulties in thus defending, modifying, or even abolishing home study are but reflections of the inevitable difficulties of the science of education. In spite of the limitations suggested in the preceding paragraph, studies of the correlation between amounts of home study and class marks are among the most fruitful lines of research to this end. (But the quality and the other purposes of home study, to be discussed later, must not be overlooked.) Such studies can be made as extensions of those suggested in regard to deviation. If deviation is decreased and other elements are practically unchanged, an increase in correlation can be expected though not definitely predicted. Furthermore, some clearly defined change of general application to the class should be made in the marking system, home-study requirements, methods of assignment, class tests, supervision of school study, or some other element of the

situation; and after this new arrangement is sufficiently established in practice to exert its influence, a study should be undertaken to measure the effect upon correlation. It would be preferable to make only one important change before each study, so as to prevent confusion of interpretation. Under expert guidance a series of such studies would reveal the sources of strength and of weakness in both the home-study practice and the marking system, and would lead to administrative efforts to increase the strength and decrease the weakness in both.

In these studies a correlation coefficient above 0.20, with a probable error below 0.08, might be considered a minimal justification of home study. The justification would tend to increase proportionately with an increase in the coefficient or a comparative decrease in the probable error. This minimum means that in a class with a home-study average of 8 hours and 20 minutes and a mark average of 85, an increase to 9 hours and 10 minutes could thus be correlated with a mark of 86.70, but 50 per cent of the class would have marks less than 86.02 or more than 87.38; or a decrease to 7 hours and 30 minutes could thus be correlated with a mark of 83.30, but 50 per cent of the class would have marks less than 82.62 or more than 83.98. Theoretically this minimum also means that an increase of 10 per cent in marks could thus be correlated with an increase of 2 per cent in home study, or a decrease of 10 per cent in marks with a decrease of 2 per cent in home study.[1]

[1] So far as he is able and has the spare time, the author will be glad to answer inquiries from specific schools or school systems regarding studies of home study in relation to school hygiene and family life. His *Bibliography and Source Book on Home Study* will be finished next fall. In the meantime he will greatly appreciate any data or opinion on home-study requirements or conditions.

EDUCATIONAL NEWS AND EDITORIAL COMMENT

The Dismissal of Chicago Teachers

Certainty in tenure of office during efficient service is necessary for the peace of mind of the teacher, as for that of all other workers. In Chicago, such security has been ruthlessly dispelled by an action of the school board, which by a close vote arbitrarily dismissed sixty-eight teachers, most of them having been in the system for many years. Previous to this "Loeb rule," Chicago teachers had been assured continued tenure of office without re-election, if they had not been charged with inefficiency during the previous year. Under the new rule, no one is sure of a position except after annual election by the Board of Education.

The faction of the Board led by President Loeb affirmed that this action was taken to rid the schools of incompetents and of insubordinates. Fewer than twenty were ranked inefficient, while forty, ranked good, superior, or excellent, were evidently considered insubordinate.

There can be no doubt as to the animus lying back of the dismissals. Activities of the Chicago Federation of Teachers, a union affiliated with the National Federation of Labor, have been obnoxious to Mr. Loeb and his friends. Thirty-eight of the discharged teachers, not one of them ranked inefficient, had been active members of the Teachers' Federation. Among their number are said to have been the last year's officers of the Federation. It will be recalled that last fall the courts granted an injunction against the Board's proposal to dismiss teachers who belonged to the union. Failing in this first attack, the Loeb faction seems to have taken in the recent rule new means of striking at the teacher's union.

The *School Review* has taken the position that a labor union of government employees is an anomaly. For instance, the sovereignty of the nation would not for a moment permit an organization among its employees which could go on strike, or take other union measures to secure higher wages or similar desires. A city school board theoretically represents the sovereignty of the citizens. To the board is delegated the authority of all the people. To permit the use of labor-union methods on the part of public employees against the properly constituted public authorities is just as unthinkable in city affairs as in national affairs. Quite another matter is a labor union using strike methods against a

private employer. Through ignorance, selfishness, or greed the employer may insist upon working conditions that are quite unendurable. There is no appeal except by force from his measures. In such a conflict neither party represents the sovereignty of the people.

While questioning their right to use union methods, we do not deny teachers the right to form federations in order to influence public opinion in legitimate ways, to advocate progressive school measures, and even, within limits, through publicity to protect individual members against prejudiced school boards. We repeat that the usual labor-union methods of enforcing the union will—these at least are thoroughly objectionable in teachers' unions. Unfortunately, the Chicago Federation has been under the domination of leaders who, with irritating persistency, have assumed the prerogatives and used the methods of labor agitators. It is little wonder that a business man like Mr. Loeb allows his prejudice against labor agitators in the business world to carry over unduly into the educational field when he sees introduced there the methods of walking delegates.

There is one significant fact that deserves further comment. The thirty-eight discharged teachers, ranked from good to excellent, members of the Federation, had been recommended for re-election by Superintendent Shoop. This officer must have been aware of the contemplated action of the Board. The Superintendent's hands may be tied by precedent; at any rate, we have heard not one word of protest. Mr. Loeb himself admits that the business man is not qualified to arrange the curriculum or to select teachers. One thing is certain: the tenure of office of school teachers should be determined, not by lay school boards, but by a competent superintendent.

Chicago is long-suffering. Playing politics in the school and with the schools has for many years been doing incalculable harm. At present the turmoil in school affairs appears to be but a faint reflection of the turmoil in the city's affairs in general. If we ever reach the time when big enough men and women, without political wires to pull, can be placed on school boards, we may have peace, but that end is not in sight. Of course the present rule makes it possible each year for 7,000 positions to be insecure—at the mercy of spoilsmen. For political reasons, any one of 7,000 teachers may now become the prey of personal antagonism. Let any teacher offend the School Board if she dare; or let an objectionable teacher seek a friend on the Board if she wishes to keep her position. A highly significant fact is that, in addition to the sixty-eight teachers who were dismissed, a certain few slated to go, but happening to possess personal friends in the Loeb faction, escaped the general slaughter.

Making "Thinkers" in Their Profession

The School of Applied Industries of the Carnegie Institute of Technology has just completed its first decade; its beginning was contemporaneous with the first widespread demand throughout our public schools for suitable industrial education. In meeting this demand Director Hamerschlag and Dean Connelley deserve abundant credit. They have laid upon themselves and their school the primary duty of organizing a thorough normal course for prospective teachers of industrial subjects. Their graduate, after completing three years of training, is far more than a mere specialist in a single trade. His course has been a combination of the theoretical and the practical. Closely allied, these two branches of instruction are designed by the school to produce, not automatons, but thinkers in industry. Broad-scope training makes it possible for the graduate to start his outside work with an unusual amount of intelligence in his trade; he is fitted to become foreman, superintendent, manager, or, best of all, teacher.

A "thinker" in the teaching profession is a specialist, to be sure, but one who sees the broader aspects and applications of his specialty—an instructor who is able to make his pupils see the meaning of their work in terms of life, a man who can impart to pupils along with technical skill an ability to interpret their work in broad social aspects. Such an instructor is indeed a teacher. Every subject in secondary education suffers from the lack of such teachers; but no subjects suffer so greatly as the industrial branches. A skilled artisan, who may be able to teach boys through imitation the handwork of his trade, may be a wretched teacher in the larger sense of the term. The School of Applied Industries, aiming to give its graduates general culture as well as manual skill, is striking exactly the right note. Every normal school should follow suit—endeavoring to prepare teachers who in their special fields are "thinkers."

What Thought-Problems for the School?

"Many an elderly professional man, looking back on his education and examining his own habits of thought and of expression, perceives that his senses were never trained to act with precision; that his habits of thought permit vagueness, obscurity, and inaccuracy, and that his spoken or written statement lacks that measured, cautious, candid, simple quality which the scientific spirit fosters and inculcates."[1]

President Eliot in this passage is arguing for a larger emphasis upon the teaching of sciences in the high school. He affirms that secondary

[1] "Needed changes in Secondary Education," *Bureau of Education Bulletin*, 1916, No. 10, p. 8.

schools are giving not more than one-sixth of their time and force to observational, sense-training subjects. He supports the introduction of more hand, ear, and eye work.

There can be no question that the courses advocated by President Eliot should receive large emphasis. The lesson in accuracy of observation, humility of unsupported opinion, together with a "cautious, candid, and simple quality" of mind—these lessons are admirably taught by science, with concrete hand and eye work.

However, there can be little doubt that the regions of thought in which most adult minds will be called upon to exercise themselves do not lie in the field of the sciences, nor in the field of eye and hand work. "Vagueness, obscurity, and inaccuracy" in habits of thought, of which President Eliot speaks, are in the fields of religion, politics, sociology, civics, and the like. His argument therefore can be applied with vigor to the end that there be increased practical work, field work, and observational work in history, civics, the study of society, literature, and the rest.

In a nutshell, the judgments men and women are called upon to make in actual life ought to be the models for the practice judgments the schools call upon them to make. Observing and solving a problem in civics is far more in line with real life than observing a problem in botany or geography.

Commercial Training for Boys a Failure

The twelfth report of the Cleveland educational survey, *Boys and Girls in Commercial Work*, discloses the astounding fact that commercial training for boys as given in the Cleveland public schools is, in the opinion of employers, a failure. Over one hundred employers report that girls have been shaped very well for the places they are to fill. On the other hand, employers disregard the preparation of boys, and proceed as if dealing with unformed material. Of boys in employment, those who have received commercial training have received no larger wages, and attained no more rapid promotion, than the boys who enter commercial work with no special training. It is to be noted that employers approve of the commercial work for girls, but deny its efficiency for boys.

Now, it may be pointed out that girls in commercial courses invariably learn stenography and typewriting, largely mechanical processes, requiring for skill little more than persistent effort. Quite different is the commercial education of boys. Boys, if trained at all, must be trained for clerical positions in which mechanical routine is not of prime value. In short, girls entering commercial life from the commercial-

training school have a chance at once to show mechanical deftness; boys are compelled to begin work in positions for which it is impossible to show the immediate results of a rule-of-thumb education. Employers, following the popular example of most business men, would probably be unable to see a connection between commercial education and success, if such a connection exists.

And yet the case for commercial education is not won. Courses in salesmanship, like courses in journalism, or, for that matter, courses in composition, by no means always show fruitful results. Indeed, the same comment may often be made about any course under the sun, from kindergarten to graduate school. If one is attempting to estimate the benefits of education solely by the student's acquisition of greater skill in some one narrow line of endeavor, he is likely to be disappointed. The suggestion of all this for commercial courses is that highly specialized work in these lines has decided limitations in value. General education should constitute the bulk of the work, presented, to be sure, so far as possible through the medium of commercial subjects. Above all, let it be remembered that the vital product of the school is judged, by business men, largely on the basis of the habits of work the school imparts.

Status of General Science

In *School and Society*, July 29, 1916, Miss Aravilla Meek Taylor presents a statistical study of the general-science situation in the High Schools of Iowa, California, and Massachusetts. Contrary to the general belief, the movement is not a new one; at least one Massachusetts school has maintained such a course for fifteen years. However, it cannot be said that any general adoption was begun until 1910. As is to be expected, general science is largely a first-year subject—135 Massachusetts schools, out of 162 reporting, place it in the first year.

Another vital fact is that general science is not mere textbook work. In Iowa, 30 out of 33 schools offer laboratory or demonstration work; in California, 97 out of 99 schools; in Massachusetts, 123 out of 161 schools. Over 60 per cent of the schools offer field work.

The fear that general science is displacing other subjects is dispelled by the fact that in most cases the course had been adopted as a new subject. However, physical geography and elementary physics seem often to have been quite largely supplanted.

After sixteen years since the introduction of general science in Massachusetts, of 184 schools reporting, 156 are classed as distinctly favorable to the subject, while only 5 are doubtful of its value or are

unfavorable. In Iowa 103 reported in favor, 13 not in favor, 27 not in favor or doubtful. Fourteen schools in California have dropped the course; none of them, however, specifically give dissatisfaction as the cause.

Miss Taylor's summaries are interesting:

1. Of a total of 533 schools from which replies were received, 293, or over half, are offering general-science courses in 1914–15 or 1915–16.

2. Of these 293 schools, 275 offer the work in the first year.

3. Of these 293 courses, 229 may be considered as year courses.

4. Of the total number, 250 schools offer laboratory or demonstration work, 162 offer field work, 148 offer both field and laboratory work, and 30 offer neither field nor laboratory work.

5. Out of the total 293 schools, 127 have introduced general science as a new course which does not supplant any other science.

6. In a total of 194 schools in Massachusetts and Iowa (this question was not sent to California) at least 118 of the teachers of general science are teaching from three to six subjects.

7. Of the 533 schools, 414 replies signified approval of the course in general science.

A Dean of Men

A dean of men, who will look after the social life and activities of men students outside the classroom, has been added to the administrative staff of the University of Wisconsin. Professor Scott H. Goodnight, who for two years has been chairman of the faculty committee on student life and interests, has been appointed dean of men.

This new office has been created at the suggestion of the Board of Visitors and others who have felt that other administrative officers, burdened with academic and departmental duties, cannot give close attention to the activities of men students—their clubs, publications, social life, and living conditions. Much of this work has been done by the faculty committee on student life and interests, and the new dean of men, as chairman of the committee, will carry the same work farther. He will endeavor to come into close personal touch with men students and to guide them in securing the greatest benefits from their university work.

Rooming-house conditions will receive his first attention. At the same time he will carry on many ideas that have been started by his committee—business-like accounting systems for student enterprises and publications, comparisons of the scholarship of members of various organizations, co-operative buying for fraternities and boarding-clubs, auditing of accounts, eligibility rules to keep weak students from attempting too many activities.

All social functions, athletics, dramatic and musical performances, and all student publications will be under his jurisdiction. In addition, he will supply the long-felt need of a faculty officer to whom students may go for advice and assistance.

The Newton Home-making School

Two hundred girls of Newton, Massachusetts, attend the Home-making Department of the Newton Vocational School. The aims of this school are: to develop mechanical skill so that the girls will be able to do the actual work of the home efficiently; to give the pupils a sufficient knowledge of the sciences related to the life in the home to work intelligently; to give them an understanding of the principles of hygiene and sanitation, in order that they may guard the health of the family; to teach them the true meaning of thrift and to make them good users and buyers and careful spenders; to give them such special training in cooking and sewing that they can, in case of necessity, support their families; to teach them the civic duties of a good, intelligent woman; to instil in them the love of good reading; to form a high ideal of home life.

Faculty Representation

Faculty representatives have been elected at Cornell University to sit in congregation with the Board of Trustees. The trustees provided for the selection of a committee of three men from the faculty of each college of the university in Ithaca (except the state colleges and the medical school, which already have their councils conferring with the Board) to meet as often as desired with the standing committees of the Board of Trustees, the Committee on General Administration, the Committee on Finance, and the Committee on Buildings and Grounds, to discuss questions affecting the welfare of the colleges. These committees consist of two members (acting with the dean) to be elected by ballot for definite terms, or, as each occasion arises, by the faculty selecting them. It was also provided that the university faculty shall select for a term of three years delegates to represent it on the Board of Trustees, not to exceed three in number. These councilors are to be elected for terms directed by the faculty and meet with the Board of Trustees and the Committee on General Administration with the usual powers except the vote. President Schurman's advocacy of this reform goes back to 1910 and his original plan, with slight modification, is embodied in this new legislation.

Educational Progress in West Virginia

As a part of the general educational progress of the past five years in West Virginia, Superintendent Shawkey speaks of "The High School Renaissance." The total number of high schools in five years has increased from 71 to 152; the number of teachers, from 293 to 637; the attendance, from 4,900 to 11,296; the annual graduates, from 487 to 1,457. This is a record of well over 100 per cent gain in five years.

This progress of high schools is perhaps the most significant feature of a widespread educational awakening, showing the following features: 15 per cent advance in number of teachers; 16 per cent advance in average salary; 38 per cent increase per capita in cost of education; 100 per cent increase in building funds; 54 per cent increase in total expenditure for common schools; 100 per cent for building funds; 107 per cent for state educational institutions. The general progress of the state school system is well represented by the increase of total school expenditures: In 1910, $4,936,701.00; in 1915, $7,799,169.00—an increase in five years of 58 per cent.

New York's Experiments in Industrial Education

In New York City, 35,000 children between fourteen and sixteen years of age annually receive work permits. Most of them leave school before entering the eighth grade. However, after February 1, 1917, every child under fifteen must have completed the eighth grade before he can receive a work permit. About 18,000 children who might go to work under the present law will be prevented after next February. These figures are indicative of the hordes of children who pour into New York industries as soon as the law allows them to do so. It is quite evident that in New York City there is a field for an experiment station in industrial education—the largest in the world.

To meet this need two sets of agencies are at work—private organizations and the Board of Education. The services rendered by John Wanamaker's, by the Department Store Education Association, by the National Association of Corporation Schools, and by similar projects are highly commendable. Hundreds of business houses are furnishing ambitious employees instruction in special branches relating to their own part of the business. Many firms make attendance compulsory. The main object in all of these private schemes is to increase the efficiency of their working staff.

Three experiments carried on by the city authorities, usually considered as industrial education, are called the Schneider plan, the Gary

plan, and the Ettenger system. The essence of the Schneider plan is that pupils shall attend school one week and do practical work in shops the next week. Pupils work in shifts, so that neither the industrial establishments nor the schools are seriously incommoded. Of course the schools teach subjects especially designed to help the student in the line of industrial work chosen by himself or his parents. Eighty-seven firms, 95 schools, and 486 students are in 1916 experimenting with this plan.

The Gary plan, as being tried in New York, is not primarily industrial, at least it is not trade or vocational education, as the Schneider plan is frankly intended to be. Superintendent Wirt repeatedly emphasizes the point that the Gary plan is prevocational. None the less, the eight schools (more in 1917) now experimenting with the Gary plan give an abundance of manual education, along with academic education. But as the children from these schools pass, as from any elementary school, directly to the higher special trade schools, the Gary plan cannot be said to be helping solve directly New York's problem of industrial education. This distinction concerning the purpose of the Gary plan is not recognized by general readers. We repeat, that the vocational feature is a very small and relatively insignificant fact of the Gary plan. The Gary plan is built upon an educational theory far broader than trade education.

The Ettinger experiment gives children in the last two grades of the elementary school a chance to try themselves out in various trades, with the definite object of finding where their ability lies. Seven elementary schools, and seventy-nine shops, including eighteen kinds of trade training, are co-operating in this experiment. In these years the work is called prevocational; it is all done in the school; the manual work is in addition to the regular academic work, and requires additional time.

These two years are followed by vocational schools in which the object is to give definite trade training. Only eighth-grade graduates are admitted. Pupils found unfitted for the trades they are attempting are led into some other more suitable form of work. To boys, woodwork, metal work, electrical wiring, drafting, garment designing, and printing are now open.

In addition the city maintains a very large number of evening trade schools. These are primarily for boys under sixteen, who are required by law to attend night schools. They are open to anyone regularly employed and not attending a day school. With these various lines of trade training New York is frankly experimenting. We shall expect to see in time a systematizing and unifying of the various experiments.

BOOK REVIEWS

Public School Administration. By ELLWOOD P. CUBBERLEY. New York: Houghton Mifflin Co., 1916. Pp. xviii+479. $1.75.

This book is one of a series of three, the other two of which are to appear soon. It deals with the organization and administration of a school system, while the other two are to be concerned with the administration of a school and with classroom teaching, respectively. In other words, the present volume is especially concerned with the work of the city superintendent, while the other two will treat particularly of the work of the school principal and of the classroom teacher, respectively.

One is likely to feel, after a superficial examination of the present book, that the author has attempted too much. The subjects, or, perhaps, the phases of the subject, are so numerous that one wishes that the author had confined himself to a narrower field. As one follows the book through carefully, however, one is gradually convinced that the author has sensed the needs and the possibilities of our public-school system; that he not only has large vision, but that he has served his apprenticeship and knows the system as no one does who has not come into intimate contact with its problems; and that he is able in one volume to treat helpfully, if not as elaborately as one might wish, the whole field that he has chosen. The knowledge of the large city school systems of the country gained through his connection with various school surveys is undoubtedly a valuable asset to the author in the production of a work like the present book.

The book is composed of three parts. Part I is devoted to a brief survey of the historical development of schools and school systems. Part II, which is the main body of the book, is entitled "The City School District and Its Problems." Under this head the author discusses the selection and the work of school boards, superintendents, principals, and teachers, the training and salary of teachers, the construction of curricula and the adaptation of the subject-matter of instruction to the various social groups and individual needs, scientific measurement in education, school health and attendance, clerical work, school funds, auxiliary-education agencies, and school records and reports.

The author has, as he remarks in his preface, sought to avoid a colorless amassing of facts, as well as a collection of confusing and contradictory opinions. He has not hesitated to give the stamp of his approval and the weight of his conviction on all of the large questions of school policy.

The chapters dealing with the organization and functions of school boards and the selection of the city superintendent, his training, personal qualifications, duties, and opportunities as an organizer, manager, and supervisor are

especially illuminating and thoroughgoing. The author advocates, for the school system, independence of the other branches of city government. He would have as school-board members successful men of wide experience in big business organizations. These men should be chosen, not by wards, as has been too often done, but by the city at large, to represent the whole city. The board should be comparatively small. The school board, after determining the large policies, should leave the carrying out of their wishes to experts in each particular field.

The superintendent must be a man in whom the board has confidence. When once he has been chosen, the board should allow him much freedom in directing the school system. The board should be essentially a legislative body and should leave to the superintendent, the educational expert, the task of devising means of carrying out their general policies, with the financial and moral support of the board.

The superintendent should be not only an educational expert. The academic and professional training and school experience here prescribed are very nearly that which the better superintendents of the country have approximated. But beyond this the author writes in some detail of the personal characteristics which are essential to a good superintendent. His personal contacts are more numerous and more varied than those of any other school officer, and it is certainly essential that he know how to deal with me—to conciliate, to lead, and to inspire.

Part III represents an attempt to apply the administrative experience of cities to county and state school systems. The state, as well as the smaller units of administration, says the author, has much to learn from the cities, both in the matter of more centralization of control and support and in the eradication of bad politics from school affairs.

Those familiar with Mr. Cubberley's earlier works will find few new ideas in the present volume. The book is decidedly worth while, however, in bringing together in one volume so comprehensive a treatment of the various phases of school administration. It will be of interest primarily to school boards and administrative officers and college teachers of school administration, but there is no one connected with the school system in any capacity, in the reviewer's opinion, who will not find some parts of the book interesting and helpful.

JOSEPH HENRY JOHNSTON

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Prevocational Education in the Public Schools. By FRANK M. LEAVITT and EDITH BROWN. Boston: Houghton Mifflin Co., 1915. Pp. v +245. $1.10.

"It is the purpose of this book to present in detail some of the school subjects, setting forth the methods which have been found to be measurably

successful, the objects which have been paramount in presenting the subjects, some of the concrete material which has been used, and references to sources of other similar material" (Preface).

How well this purpose of the author's has been realized may be imagined from a glance at the table of contents. There are twelve chapters. While each is a valuable part of the whole you will find any one, read for the subject it covers, complete in itself, and rich in helpful suggestions in your work now. These chapters are: (i) "The Nature and Purpose of Prevocational Education"; (ii) "Prevocational Education a Natural Development of the School System"; (iii) "Vocational Education a Local Question"; (iv) "The Inauguration of Prevocational Classes"; (v) "Personal Characteristics of Prevocational Boys"; (vi) "Appropriate Subject-Matter for Prevocational Classes"; (vii) "Physiology and Hygiene"; (viii) "History"; (ix) "Science"; (x) "English"; (xi) "Mathematics"; (xii) "Shopwork and Drawing"; "In Conclusion." An index is appended.

While the authors point out unmistakably that prevocational education is primarily for the over-age or retarded pupil, the question constantly arises in one's mind, as he runs through the book, "Why should such excellent ideas, plans, and methods be limited to this one type of child?" Their answer to this is: "It is neither desirable nor necessary to relinquish traditional practices which are contributing so surely to the progress of many school children, but it is quite another matter to urge the adoption of different courses and new methods for that considerable group of children who do not succeed with the traditional work"—in other words, expediency. Yet if the vocational ideal and its educational opportunities as herein set forth are to arrive, they must be offered eventually to all children.

In this connection the following quotations from chap. i, "Nature and Purpose," are of interest. "Prevocational work is intended to be as cultural and as inspirational as any of the regular school work for the children to whom it is given; but it is more valuable than the regular work as a preparation for the subsequent occupational experiences of these children, most of whom enter 'vocations' at an early age; and it is a better and more attractive preparation for the vocational courses higher up than is the regular course for which it is substituted. . . . .

"Prevocational work, therefore, has come to have a clearly defined purpose, namely, to secure an adjustment of the 'system' to these vocationally minded pupils. They need the fundamental book subjects as much as the others, and if the 'bookish' way of teaching does not make its appeal strongly to them, the problem is to vitalize such work by devising other methods and by accepting different, though not necessarily lower, standards of attainment than those by which school work is usually measured. . . . .

"The new educational program provides for the bringing together in actual realization the necessity for hard work and the joy in its accomplishment. . . . .

"When our high schools shall become thoroughly democratized, and when 'secondary education' shall mean education appropriate for any and all normal children between twelve and eighteen years of age, it may well be that prevocational work will pass off the stage and that the term will no longer have any significance. For the present, however, 'prevocational' must stand for the symbol of liberality in providing, either in our upper elementary grades or in our high schools, appropriate types of educational activities for all children, and for a promise that such work will be administered in the spirit of justice and impartial sympathy."

In chap. vi, "Appropriate Subject-Matter for Prevocational Classes," will be found the best possible statement of just how and upon what basis the subjects for a course for a prevocational class are to be selected. The answers given to this problem in any school system determine whether your prevocational work is but another readjustment in school time and material or real educational adjustment.

The remaining chapters, each dealing in detail with one of the subjects of the curriculum, are simple and direct, based upon actual use in prevocational classes.

For those who are accustomed to think of prevocational work as a sort of semi-industrial training course for ne'er-do-wells, chap. xii, "Shopwork and Drawing," contains much that will surprise them. For example, the opening paragraph: "While the shopwork in a prevocational course of study has considerable vocational value, its major purpose is inspirational rather than vocational, its function being to give education an atmosphere which seems more practical to the pupil, and which is more closely related to active adult life than is the work of the ordinary schoolroom."

This excellent little book should reach a wide field of service. There is but one serious omission that will be noted by any one in the West: "Where is the girl in prevocational work?" With woman suffrage in every Western state, educational plans must make equal provision for both boys and girls. Doubtless the authors will later supply this need in another book. It would take another book to give the work necessary for the girls in prevocational education.

BEN W. JOHNSON

SEATTLE, WASH.

An Introduction to School Hygiene. By W. B. DRUMMOND. London: Longmans, Green, & Co., 1915. Pp. x+237. $1.25.

This very practical little book gives a simple and condensed statement of the methods of examination and common defects of school children, and of what can be done to correct them through hygienic measures. The feeding of children, outlines of work, rest and sleep, and the various types of both simple and serious nervous disorders are carefully discussed. The hygiene of exercise,

seating in relation to posture and writing, and personal hygiene, including tonsils, adenoids, eyes, and ears, is dealt with in such a manner as to be of the greatest value to teachers. This may be said also of the presentation of the subject of infectious diseases, which is in every way up to date. The material on school buildings and grounds is excellent so far as it goes. In short, this is one of the ablest of the briefer books on school hygiene that has been given to the public.

JOSEPHINE YOUNG

UNIVERSITY OF CHICAGO

A Practical Algebra for Beginners. By THIRMUTHIS A. BROOKMAN. New York: Scribner, 1915. Pp. xvii+322.

The values of a high-school subject determine largely whether or not that subject should be entitled to a place in the curriculum. Teachers of secondary mathematics will be interested in a textbook which aims to make a close connection between the principles of elementary algebra and their applications in daily life. This book contains five short chapters on applied problems, such as algebra used in mensuration, similar right triangles used in measurement, inverse proportion in belted pulleys, graphs of statistics and equations, formulae concerning bolts and screws, horse-power of locomotives, etc.

The author has aimed to write a book for "the pupils' sake" and to lower the "unduly heavy mortality in elementary algebra by three lines of emphasis—the inductive method, the union with geometry, and the use of the applied problem." The amount of algebra is equivalent to what is ordinarily covered in one year, including quadratic equations in one unknown. In addition to this it contains a chapter on the laws of exponents.

E. R. BRESLICH

UNIVERSITY OF CHICAGO

Dante: How to Know Him. By ALFRED M. BROOKS. Indianapolis: Bobbs-Merrill Co. Cloth, 12mo, with a frontispiece. $1.25 net.

After one has followed to its end the story as it is presented by Professor Brooks, of Indiana University, in an excellent translation of Dante's own words, one feels that the *Divine Comedy* need no longer be a closed book for any reader. In narrow compass the author has given the story of the drama, with adequate description of the stage setting and other details that will make easy the path to a sincere and intimate appreciation of one of the great books of the world.

One gets from the book the sense that Dante is a living force in the present world; that his *Divine Comedy* is filled with truth and wisdom in the mold of beauty; that it is a wonderful book, which should be much more generally read.

List of Books for Township Libraries. By O. S. RICE and BERTHA BERGOLD. Issued by the State Department of Education, Madison, Wis.: 1916. Pp. 264.

This is a pamphlet which should be possessed by every school. A very large number of books suitable for boys and girls are carefully catalogued and described. Those who believe that the problems of teaching reading will be greatly lessened by providing suitable books for outside reading should make a study of this admirable pamphlet.

Geschichte und Sage. By ANNA T. GRONOW. Boston: Ginn & Co., 1916. Pp. 330. $0.90.

Geschichte und Sage is a reader and grammar for second-year German in high school. It is admirably adapted to follow the same author's *Jung Deutschland*, already widely known.

Special stress is laid on the teaching of vocabulary. Frequent repetition in the text affords constant practice in the recognition of words. Each lesson provides, besides, drill in the use of opposites and synonyms actually appearing in the text, drill in the formation of words, both simple and compound, and in idioms. Vocabulary reviews are numerous.

The reading-matter touches upon important facts in German history, geography, and literature in a simple and effective way that arouses the pupil's immediate interest. The passion play at Oberammergau, Hans Sachs, Wallenstein, German cities in the Middle Ages, and Bismarck are characteristic subjects.

The grammar exercises to accompany the reading are grouped at the back of the book. They comprise exercises in German calling for various types of grammatical work, and English sentences to be translated into German. The material gives a thorough review of the first year's work and as much new grammar as can be covered in the second year. Grammatical rules are given in English.

Geschichte und Sage is especially adapted to the needs of those teachers who are using the "direct method," and is an invaluable addition to books for second-year work.

Solid Geometry. By WILLIAM BETZ and HARRISON E. WEBB, with the editorial co-operation of PERCY F. SMITH. Boston: Ginn & Co., 1915. Pp. xxii+178. $0.75.

The book begins with an introductory chapter of eleven pages which aims "to assist the student to overcome the difficulty in forming a mental image of three-dimensional figures, and to help him to interpret correctly such a figure

when it is already drawn or merely described in the text." This little chapter is suggestive as to what might be done to illustrate the theorems and figures throughout the course.

Instead of following the traditional order of topics the authors have reorganized the material, treating at the same time prisms and cylinders, pyramids and cones, polyhedral angles and spherical polygons, etc. This is a step in the right direction. It is psychologically sound and makes a number of theorems unnecessary, thus gaining time for more original exercises.

The large number of informal proofs is a commendable feature of the book. Numerous illustrations and practical problems will help to impress the student with the value of the subject. Since most solid geometries are nearly of the same type, teachers will welcome this little volume, which is a strong attempt to improve the course.

E. R. BRESLICH

UNIVERSITY OF CHICAGO

How to Know Your Child. By MIRIAM FINN SCOTT. Boston: Little, Brown & Co., 1915. Pp. 316. $1.25.

This is a well-selected collection of concrete examples which the author has gathered in her dealings with little children. She has demonstrated on every page that she is an expert in treating childhood difficulties, that she herself knows the child, and that she knows how to interpret him to others.

Instead of dealing with abstract principles, she recites actual cases of children who, seeming to be vicious, ill-tempered, selfish, untruthful, and disobedient, were actually the victims of wrong treatment, and shows how she diagnosed such cases and put in operation the forces which removed the difficulties.

In the hands of one less skilful this method might result simply in a book of interesting anecdotes; the author has, however, carefully chosen each case to illustrate some particular principle, and made it applicable to a whole group of cases.

The chapters on constructive play, on how to organize it, and on the materials to be used, form one of the strong features of the book.

In these chapters the mother is shown how play may be used to foster normal curiosity, imagination, imitation, and self-dependence, and how she herself may make the most of herself and of her life. Altogether the book is very helpful and readable, if perhaps a trifle too long.

JEANNETTE WINTER HALL

BERWYN, ILL.

BOOK-NOTES

(Detailed discussions of some of the following books will appear later.)

AITCH, N. H. *The Golden Book of Favorite Songs.* 3d ed. Hall and McCreary, 1915. Pp. 128. $1.50 a dozen.

An admirable selection of old favorite songs.

ALLEN, PHILIP SCHUYLER, and PHILLIPSON, PAUL HERMANN. *A First German Grammar.* Boston: Ginn & Co., 1916. Pp. xix+436. $1.00.

ANDRESS, J. MACE. *Herder as an Educator.* New York: G. G. Stechert & Co., 1916. Pp. 316.

ANDREWS, CARLETON. *The Technique of Play Writing.* Springfield, Mass: Home Correspondence School. $1.50.

Extremely helpful suggestions for teachers of composition and for amateur writers of plays.

BAKER, JAMES H. *American University Progress.* New York: Longmans, Green, & Co., 1916. Pp. 189. $1.00.

BANCROFT, JESSIE H. *Handbook of Athletic Games.* New York: Macmillan, 1916. Pp. xxv+625.

BOLENIUS, EMMA MILLER. *Teaching Literature in the Grammar Grades and High School.* Boston: Houghton Mifflin Co., 1915. Pp. xv+337.

BOURNE, RANDOLPH S. *The Gary Schools.* Boston: Houghton Mifflin Co., 1916. Pp. xix+204. $1.15.

BRONSON, WALTER C. (editor). *American Prose.* Chicago: The University of Chicago Press, 1916. Pp. 737. $1.50.

CARUS, PAUL. *The Venus of Milo.* Chicago: Open Court Publishing Co., 1916. Pp. 181. $1.00.

CLAYDON, ELLEN P. and C. A. *Needlework without "Specimens."* New York: E. P. Dutton & Co., 1916. Pp. 237. $1.50.

COUDE, BERTHA. *The Business of Being a Friend.* Introduction by RICHARD CABOT. Boston: Houghton Mifflin Co., 1916. Pp. 122. $1.25.

DAMON, LINDSAY TODD (editor). Palgrave's *Golden Treasury.* Chicago, Scott, Foresman & Co., 1916. Pp. 437.

DEVITIS, M. A. *A Spanish Grammar for Beginners.* Boston: Allyn & Bacon, 1915. Pp. xviii+334.

FENTON, HENRY JOHN HOUSTON. *Physical Chemistry for Schools.* Cambridge: University Press, 1916. Pp. 215. $0.90.

FREEMAN, FRANK N. *Experimental Education.* Boston: Houghton Mifflin Co., 1916. Pp. 220. $1.30.

Report of the Secretary of the General Education Board, 1914–15. New York: General Education Board, 1916. Pp. 82.

DANEILL, MOSES GRANT (editor). Macaulay's *Lays and Ballads*. Boston: Ginn & Co., 1916. Pp. 166. $0.30.

HALLIDAY, J. *Bookbinding as a Handwork Subject*. New York: E. P. Dutton & Co., 1916. Pp. 73. $1.00.

HELD, FELIX EMIL (translator). *Christianopolis*. New York: Oxford University Press, 1916. Pp. 285.

HERZBERG, MAX J. (editor). *Boswell's Life of Johnson*. Boston: D. C. Heath & Co., 1916. Pp. 280.

HOLLISTER, HORACE A. *Report of the High School Visitor*. Urbana, Ill.: University of Illinois, 1916. Pp. 56.

JESSUP, WALTER A. *The Teaching Staff*. Cleveland: Survey Committee of the Cleveland Foundation, 1916.

KIRKPATRICK, EDWIN A. *Fundamentals of Sociology*. Boston: Houghton Mifflin Co., 1916. Pp. 288.

LEWIS, CALVIN L. *American Speech*. Chicago: Scott, Foresman & Co., 1916. Pp. 246. $0.80.

MAXCY, CARROLL LEWIS. *The Brief, with Selections for Briefing*. Cambridge, Mass.: Riverside Press, 1916. Pp. 332. $1.25.

The larger part of this book is made up of interesting illustrative examples of argumentative addresses. The first eighty-five pages set forth the principles of constructing an argumentative brief. An interesting departure is the chapter on a legal brief, which is wanting in most books on argumentation.

MOORE, HARRY H. *Keeping in Condition*. New York: Macmillan, 1916. Pp. 137. $0.75.

Intended primarily for boys from fourteen to nineteen years of age. Useful also to parents, teachers, club leaders, and to all associated with boys.

MOSHER, JOSEPH A. *The Essentials of Gesture*. New York: Macmillan, 1916. Pp. 188. $1.00.

NEILSON, WILLIAM ALLEN (editor). *As You Like It*. Chicago: Scott, Foresman & Co., 1916. Pp. 207.

POUND, LOUISE (editor). *Goldsmith's The Deserted Village*. Boston: Ginn & Co., 1916. Pp. 86. $0.25.

PRICE, W. R. (editor). Gerstäcker's *Irrfahrten*. New York: Scribner, 1916. Pp. 245. $0.50.

RANOUS, DORA KNOWLTON. *Good English in Good Form*. New York: Sturgis & Walton Co., 1916. Pp. 248. $1.00.

A compendium of a large number of words and sentences setting forth the customary bad practices, together with the preferred practices. An excellent desk-book for any teacher of English.

RETTGER, LOUIS J. *Elements of Physiology and Sanitation.* New York: A. S. Barnes Co., 1916. Pp. 389.

SARGENT, WALTER, and MILLER, ELIZABETH E. *How Children Learn to Draw.* Boston: Ginn & Co., 1916. Pp. 264. $1.00.

SCHOLTZ, MOSES. *Sex Problems of Man.* Cincinnati: Stewart & Kidd Co., 1916. Pp. 168.

SCHÜTZE, MARTIN (editor). *Goethe's Poems.* Boston: Ginn & Co., 1916. Pp. 277. $0.75.

SHERBOW, BENJAMIN. *Making Type Work.* New York: Century Co., 1916. Pp. 129. $1.25.

SLEEMAN, J. H. (editor). *Tacitus, Agricola and Germania.* Cambridge: University Press, 1916. Pp. 211. $0.75.

SMITH, GEORGE J. (editor). *Longmans English Grammar.* New York: Longmans, Green, & Co., 1916. $0.65.

A revised edition of the well-known Longmans text.

THOMPSON, DANIEL V. (editor). *British Verse for Boys.* New York: Henry Holt & Co., 1916. Pp. 374.

UNDERWOOD, ETTA M. *Heroes of Conquest and Empire.* New York: Macmillan, 1916. Pp. 178. $0.48.

An excellent reading-book for the middle grades.

United States Life Tables (1910). Washington, D.C.: Bureau of the Census, 1916. Pp. 65.

WALTERS, FRANCIS M. *The Principles of Health Control.* Boston: D. C. Heath & Co., 1916. Pp. 476.

WEBSTER, EDWARD HARLAN. *English for Business.* New York: Newton & Co., 1916. Pp. 435. $1.20.

An English composition book which combines the essentials of the older type of texts with constant application to practical business life. A unique feature is the series of illustrations dealing with business topics.

WARDLE, ADDIE GRACE. *Handwork in Religious Education.* Chicago: The University of Chicago Press, 1916. Pp. 143. $1.00.

WEEKS, ARLAND D. *The Avoidance of Fires.* Boston: D. C. Heath & Co., 1916. Pp. 117.

This is a unique departure in textbooks, by the professor of rural education in the University of North Dakota. It is entirely suitable as a reading-book for the upper grades.